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MY BOY!

Captain Thaddeus W. Kallini, *United States Air Force*
7050th Air Intelligence Service Wing, Germany

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

"MY BOY is going into the service!" cried the distraught mother.

How many times have you heard mothers say that? It is usually said with heart-rending anguish. And, worse yet, behind this cry lies the conviction that dear, clean-cut, upstanding Junior will now become a bum. As he puts on that uniform for the first time, he will go through a terrifying transformation, his eyes will acquire an evil glare, his teeth will become fangs and, from that moment on, he will gamble, drink to excess, and consort with women of dubious virtue.

I have heard this sorrowful statement so many times that I now retaliate automatically. First, I justify my right to strong opinions by stating my experience and length of service—to date, I have not met any mothers with more military service than I have. Then I let them have it.

The military has within its ranks a cross-section of our country—the good, the fair, and the bad. However, because of mental and physical standards, some of the bad ones never get in. Other undesirables are inducted, tried, and discharged! That should make the military

a shade better than the cross-section of the country—shouldn't it? When a man first joins a unit, he immediately comes into contact with this cross-section. His unit will probably be comprised of men from all parts of the country, from all walks of life, and from all strata of society. The son of a financier will often be teamed with the son of a fisherman. The son of a professor might work with the son of a plumber—and so on. The new recruit will live and work with men he would never meet in civilian life. That is Democracy in action, isn't it? Wouldn't you say it was good training for the future?

On duty, he will live and work with whomever Fate and Headquarters may put in his group. Off duty, he will pick his own friends. Generally, we find that men gravitate toward their own kind. The Shakespearean fans seek each other out as do the *Spicy Stories* fans. Sometimes, a man pulls a switch and joins a group other than the one which we might call "his kind." This switch may work either way—for better or for worse.

At this point, Mother's eyes gleam with victory as she points out that I admit that Junior is exposed to bad influences. Then I move in my artillery.

It is my considered opinion that a man will not change his stripes in the military—if he has been brought up properly. If he has been taught the difference between right and wrong from childhood; if

Discipline—the acceptance of authority—is an integral part of a well-adjusted person's behavior pattern. Most people without discipline are misfits—whether or not they are members of the military services

he has been convinced of the wisdom of moderation in all things; life in the military will not change him.

There is no one exception to this. A few men have a flaw in their characters—a weakness, a chink in the armor—a flaw which does not come to the surface so long as they stay in their own environment. They will not do anything their crowd does not do. Once in the military, exposed to new influences, this weakness sometimes flares up. Can the services be blamed for that? Is it not logical to assume that this might have happened eventually—military service or not? But what mother will admit that her pride and joy is or has a weak character?

Civilian criticism of the military has always struck me as unfair. For example, if a man in uniform is seen walking in a neighborhood of ill repute, everyone immediately squeals, "Oh, look, a *Soldier!*" Fifty male civilians can practically establish residence in the area, and nobody gives it a second thought. If a soldier creates a disturbance in a public place, everyone blames the *service*. If a civilian does the same thing, the public blames the individual—"tain't fair.

There is one outstanding benefit that military service usually leaves with a man which is often overlooked.

Let's face it. Regardless of how good a father Pop is to his children, his greatest expenditure of time is devoted to making a buck. He may breakfast with his brood. He then sees them at dinner and perhaps for a few hours after dinner. If he is lucky, he has Saturday and Sunday at home and that is *it*. If his job

requires travel, he sees them even less. That leaves Mother in charge—Mother and other ladies—their schoolteachers. The ladies, bless 'em, are wonderful. I'm convinced they're here to stay. In my opinion, the mental and emotional make-up of women is such that it should be supplemented by the male outlook in the rearing of male children. A mother will generally preach, "Avoid a fight—at all costs." Pop will preach, "Fight, and retain your self-respect!" Where Mother's protective instincts might cry, "Don't! It won't work!" Pop might say, "There's one way to find out—try it!" But perhaps most important, there is the question of discipline. Mother can usually be swayed more easily than Pop. If Junior wants to put forth the effort, he can write his own ticket with Mother. Pop is more difficult. Pop's the disciplinarian—he is the one who dishes out the punishment.

Discipline—the acceptance of authority—is an integral part of a well adjusted person's behavior pattern. A man without discipline is a misfit—in or out of the military. Because of our way of life, the male children often do not get their full ration of training in discipline. Male children are overprotected. They are not permitted to sink or swim by their own decisions. Their acquaintance with authority is often sketchy at best.

And then they enter the service. In some cases, their first encounter with a good noncom is their first encounter with real "do it—then ask questions!" authority. At first it is a terrifying shock. Then they start conforming. Being on their own also presents new problems which they gradually begin to solve—without help from Mother or Pop. Soon Junior acquires a more mature outlook, accepts authority, and stands on his own two feet. So relax, Mother, and look proud instead. If your boy is all that you believe he is, we shall probably send him back even better.

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Planning the Counterattack

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NEARLY every war in which the United States has been an active participant has followed the same general pattern or sequence of events, namely: a period of retrograde operations—delaying tactics, trading space for time; a period of defensive operations—providing time for the necessary buildup; the counteroffensive—seizing the initiative from the defensive; and, finally, the offensive—usually on a large scale—aimed at the destruction of the enemy's will and potential to continue the conflict. It can be assumed that any future war will undoubtedly follow a similar pattern.

The purpose of this article is to discuss the second period, the defensive, and more specifically the *counterattack*, which is the decisive element of the defensive. In order to discuss the rather detailed, complex, and somewhat difficult subject of counterattack intelligently and simply, the entire discussion will be limited to the counterattack as it applies in the position defense, wherein the bulk of the force is disposed in selected defensive localities where the decisive battle is to be fought.

First, the discussion will deal with the sound and realistic visualization and co-ordination necessary to produce a workable plan—to include the necessary factors and items which must be considered thoroughly in the planning stage. This will result in the *graphic* portion of the plan, which

should be simple, clear, and which is usually prepared first. Following the planning phase, the *writing* of the plan will be covered. The written plan, when ordered into execution, will ensure—with minimum changes and modifications—the maximum co-ordinated effort on the part of all components of the force. The written portion is prepared in detail, and is as complete as time and circumstances will permit.

Counterattack Categories

All counterattacks can be divided into two broad categories, depending on the echelon at which they are considered. At the division level, a counterattack by the reserves of one of the frontline regiments is called a local counterattack. All elements of the counterattacking force are under the command of a single commander. Although not usually launched against a strong enemy penetration, they are launched to regain key terrain and can, therefore, be preplanned and rehearsed. The next higher commander must be informed when local counterattacks are made. Still, at the division level any counterattack by a part or all of the division reserve is classed as a major counterattack and requires considerable time to arrange for sufficient reserves supported by adequate fire support. Advanced planning for major counterattacks

The counterattack is an offensive operation conducted from a defensive situation. Providing the planning is correct, counterattack plans can be placed into effect with a minimum of modifications or changes

is essential in order to reduce the time necessary for final preparation and execution.

A counterattack differs from an attack only in that it is delivered from a defensive position or situation. Similar to the attack, it is equally dependent upon the elements of surprise and speed of execution and requires the same carefully co-ordinated support of all available weapons. A counterattack plan contemplates a single co-ordinated blow, delivered by as large and strong a force as the situation and terrain will permit. The likelihood of success of the counterattack varies with the thoroughness of the planning.

Counterattacks usually become necessary when an important locality has been lost or is threatened, or when the enemy has created a dangerous gap in the position from which he will be able to attack stronger positions of the defense from directions unfavorable to the defender. Whenever one or both of these conditions exist, the commander is faced with a decision to counterattack in order to accomplish his mission or call upon higher headquarters for assistance. The decision to counterattack or to occupy prepared positions is a command decision and is arrived at only after a careful consideration of all the factors wherein the indications of success are balanced against the indications of failure. When the com-

mander believes that the counterattack will succeed, the answer is obvious. He counterattacks with everything available. If the odds are against success, the commander fixes and holds the enemy by fire from prepared positions and informs the next higher commander of his actions. Before a commander can make a sound decision, however, he must understand the principles of the counterattack, and he must know the conditions under which a counterattack is required.

The reserve of any unit should be committed only when its employment will result in decisive action. It follows then that counterattacks are launched when they will result in decisive action, namely: the restoration of the original battle position or the destruction of the enemy. Perhaps, then, timeliness becomes one of the most important considerations. A counterattack should not be launched until the penetration has been determined as the principal threat to the defender or until the penetration has been slowed or stopped and there is a good possibility of success. A good counterattack plan depends to a great extent upon the element of surprise. Without these conditions, the commander may decide that it is better to block with forces available and call upon the next higher commander for the necessary assistance in the form of a major counterattack. The decision to counterattack or not to counterattack may very well be one of the most difficult decisions any commander will ever have to make.

Level of Planning

Counterattack plans are essentially plans for limited objective attacks; therefore, the sector commander usually prescribes the objectives, direction of attack, attack positions, forces involved—including command thereof—and provision for fire support plus any other details critical to the plans, including priority of prep-

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aration. As an example, the division will plan and publish counterattack plans to all major subordinate units of the division. The reserve commander—who will in all likelihood be the counterattack commander—based upon directives or plans received, will recommend modifications or additional plans, will complete the plan in detail, and will submit them to division for approval. This procedure is identical to the development of any attack plan and will ensure a plan which is both workable and has the best chance for success. This course of action will then be co-ordinated by the division which will use all available units and fire to destroy the enemy and restore the battle position. Of course, it will be necessary upon receipt for subordinate units to prepare and issue plans of their own. Normally, the division plan is effective for planning upon receipt and for execution on order.

Mission and Terrain

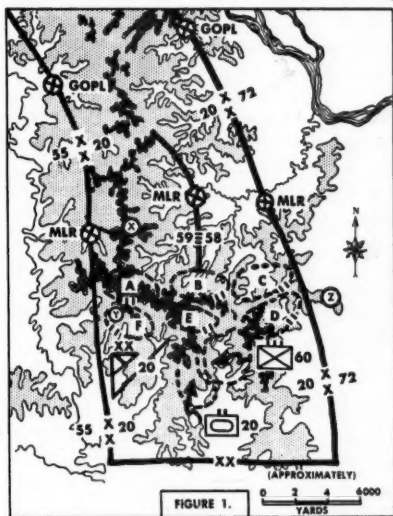
The balance of this discussion will be limited to the consideration of major counterattacks at the division level. Should the enemy threaten with a penetration that may rupture the battle position, the division is the lowest echelon at which sufficient reserves, supported by adequate fire support, are available to one commander which are considered strong enough to slow up, stop, and eject the enemy from the battle position.

A Situation

Before proceeding into the considerations of the counterattack plan, it is necessary to stop for a minute and consider briefly the mission of the command. In an assumed situation, the 20th Infantry Division—an interior division of I Corps—has been directed to organize, occupy, and defend the assigned sector (see Figure 1). Assuming that the Commanding General, 20th Infantry Division, understands his mission and is fully confident that he has the forces and the means to

accomplish it, he must decide early just what he must achieve with his force in order to ensure the fulfillment of the mission as assigned to him by the next higher commander.

In developing his defensive position, the commander makes detailed plans for the use of every means available to him to stop the attacker in front of the main line of resistance. But he must not stop



there. He fully realizes and appreciates that no matter how strong, how well-planned, and how well-organized his defensive position may be, the attacker—willing to pay the price in men, material, and time—can penetrate his position; therefore, the commander must plan for every contingency. He must foresee every likely penetration and then prepare a plan to counteract this threat, when and if it materializes. In his defense orders, the commander directs that counterattack plans be prepared for each likely area of penetration, and gives a priority to areas which—when penetrated—will be critical to the defense of the position. Therefore,

he must determine first the ground which must be retained in order to accomplish his mission; and just how far he can permit the enemy to penetrate before drastic action in the form of counterattacks must be taken to eject him from the battle position.

From this premise, we determine the necessity of specifying critical terrain features, the retention or seizure of which provides a marked advantage to either combatant. The counterattack plan, therefore, starts with an understanding of the mission and the terrain, to include the determination of the critical terrain features having an effect on the accomplishment of the mission. In this situation the critical terrain is the north-south ridge from X—the highest terrain along the main line of resistance—through Y—the highest terrain in the division section—and west-east ridge Y through Z—the highest terrain in the area shown in Figure 1.

Assumed Penetration

A limited amount of time is usually available to the defending commander during which several counterattack plans can be written and rehearsed. This time is provided by the security forces under higher headquarters and the general outpost provided by the sector commander to garrison the general outpost line.

In order to best utilize this time, certain assumptions must be made and incorporated into the counterattack plan itself. The most important of these is the assumed penetration. Time permitting, counterattack plans are prepared on the basis of all probable enemy penetrations and are rehearsed by at least the key personnel in the counterattacking force. The assumed penetrations should be logically and soundly conceived and should—as nearly as possible—depict a situation well within the capability of the enemy—implying the loss or threat of loss of an impor-

tant locality. The G3 must study the terrain carefully and consider the critical terrain that must be protected and the avenues of approach thereto which must be controlled before he can logically arrive at an assumed penetration. The blocking positions which the reserve has been directed to prepare have a marked effect on any counterattack plan inasmuch as they too have been placed to control the avenues of approach within the position and should be located to protect the critical terrain.

Having made his study, the G3 draws an assumed penetration into the division sector—usually starting with the most likely area and aimed at the most critical terrain in the sector—using, wherever possible, the best enemy avenue of approach. The G3, 20th Infantry Division, has made his study and drawn the most likely enemy penetration in the sector of the 59th Infantry along the best avenue of approach toward the critical terrain X-Y (see Figure 2). The depth of the penetration has been limited to the area just north of blocking position A, the maximum depth to which the enemy can be permitted to penetrate. The counterattack must be launched in time so as to hit the enemy in force at, or prior to, the time he has reached this depth. The assumed penetration is the first graphic part of the counterattack plan arrived at by the G3 in his backward planning and will—time permitting—be closely coordinated with the commander having responsibility for the defense of that sector—in this case the Commanding Officer, 59th Infantry.

The assumed penetration is normally shown on the graphic portion by a double line indicating the area in the sector supposedly lost to the enemy and from which he must be driven in order to restore the battle position.

The positions prepared by the division reserve are indicated on the graphic por-

tion (overlay) of the division operations order for the defense. These positions have been carefully selected and one or more will—in most cases—be occupied during a counterattack in order to ensure that the penetration is slowed, stopped, and contained in conjunction with the maneuvering element of the counterattacking force which will either destroy or eject the enemy from the battle position. Provisions must be made to block the penetration. In this example, blocking position A is ideally located to check any enemy penetration along the high ground running south from X. The G3 then decides that this position should be occupied in conjunction with any counterattack to reduce an enemy penetration along this high ground. The force occupying blocking position A should be an infantry battalion or an infantry battalion reinforced, under the command of the counterattack force commander, to ensure unity of command and effort in the area of the penetration. These positions to be occupied should be indicated by a solid line goose egg inclosing the unit symbol of the unit to occupy.

Objective

The enemy penetration must be reduced and the battle position restored as quickly as possible. To accomplish this, it is necessary to select an objective, the seizure of which will destroy the enemy or restore the battle position. The G3 in this case has selected the high ground in the middle of the assumed penetration—Hill X—which, if seized and retained, will force the enemy to withdraw from the position or be destroyed. This objective has been selected after co-ordination with, and consideration of, the recommendations of the Commanding Officer, 59th Infantry.

The technique of indicating the objective in the assumed penetration is considered more desirable than omitting the objective on the graphic portion and indicating, by the limiting points only, the

fact that the incoming unit must restore the battle position and assume defense of the sector. By using the objective technique, the attention of every unit is focused upon the critical area in the penetration which must be seized and retained. The objective should be indicated by a solid line goose egg containing the letters "Obj."

Direction of Attack

The counterattack is a division effort and depends upon success through the co-ordinated and combined effort of all units of the division. As a guide to the counterattack commander—and to ensure this necessary close co-ordination by all units—it is considered necessary that a direction of attack be indicated so that the mass of the counterattacking force will move along a prescribed route, utilizing the best terrain and hitting the enemy penetration on a flank—or wherever he is the weakest. Attacking along high ground—which denies the enemy dominant observation over the counterattacking force, and which leads directly to or toward the objective—will facilitate success. Such a direction of attack will afford dominant observation along the selected route and should, where possible, employ terrain favorable to the use of armor. The direction of attack and the line of departure are so closely related that one influences the other. Selecting a direction which strikes the flank and crosses the base of the penetration enables the counterattacking force to pinch off the penetrated area and thereby regain the main line of resistance and prevent the enemy from reinforcing his troops in the penetrated area.

The direction of attack should be indicated by a solid arrow extending from the line of departure to or into the objective area. It is *not* labeled.

As another co-ordinating means, the G3 should select a line of departure which

is recognizable on the ground and should be approximately perpendicular to the direction of attack. This is the line from which the counterattacking force will launch the attack into the penetrated area. The line of departure facilitates the co-ordination between the elements of the counterattacking force and the control of supporting fires and should be as close to the penetrated area as possible in order to ensure maximum control of the counterattacking units. It is highly desirable that the line of departure has some protection from small arms fire and other flat trajectory weapons. It may be necessary—because of local conditions—to indicate two or more lines of departure for an assumed penetration. If such is the case, they should be numbered—starting with the line of departure that is the closest to the penetration. It is considered absolutely necessary that a line of departure be indicated in a counterattack plan at the division level because it must be rehearsed by many individuals and units, and they must co-ordinate these rehearsals. Many times the line of contact will become the line of departure for the execution—especially if the situation has developed rapidly and becomes fluid before the counterattacking force has made contact.

The line of departure is indicated on the overlay by means of a short solid line labeled "LD."

Attack Position

In order to ensure the best possible control and co-ordination on the part of the counterattacking force, it is necessary that an attack position be indicated as close to the assumed penetration as possible. This area should be accessible by concealed routes, in defilade, and provide some security to the force while it is assembling for the attack. Consideration must be given to the selection of the attack position so that it avoids

friendly defensive areas and blocking positions and is large enough to permit dispersal of the force until it is ready to attack. The counterattacking force should be able to move into and out of the attack position with the least amount of delay or interference from the enemy. Such movement plans should include the use of smoke on enemy-held terrain or within the battle position in order to screen this movement. It may be necessary to designate separate routes to the attack position for units of the counterattacking force. Inasmuch as this area may be located in the sector of two or more units, it will require a great deal of co-ordination as to the use of roads, traffic control, communication, and other facilities between the several units involved.

The attack position is indicated by a solid line goose egg containing the letters "Atk" and should, as nearly as possible, indicate the actual area which will be required by the counterattacking force.

Visualization of the Plan

With the indicating of the attack position, the G3 has completed his visualization of the counterattack plan for the assumed penetration along the high ground running south from X. He has considered and indicated the following graphically on his overlay:

1. The assumed penetration.
2. The occupation of blocking position A.
3. The objective.
4. The direction of attack.
5. The line of departure.
6. The attack position.

The last four items, 3 through 6, are considered as essential items of *any* counterattack plan. They can easily be remembered by the use of the mnemonic LOAD, standing for: *Line* of departure, *Objective*, *Attack* position, and *Direction*

of attack. It should be noted here that the graphic portion of the plan has been prepared first and will be followed by the written portion which will tell subordinate units what they are to do in order to execute the plan as visualized by the G3.

Just how much of the counterattack plan has been accomplished to this point? Perhaps the best check at this time are the elements of the decision, the *who*, the *what*, the *when*, the *where*, the *how*, and the *why*.

The *who*, of course, is the 20th Infantry Division, the *what* is to counterattack. The *when* will be accurately determined only by the enemy and his operations against the division. Inasmuch as this may be either a day or night attack, the *when* is stated as H-hour, D-day. The *where* has been decided upon for this one penetration as being along the high ground running south from Hill X and along the best avenue of approach in the division sector. The objective in the vicinity of Hill X, together with the direction of attack indicated in the graphic portion, fixes the direction for the counterattacking force.

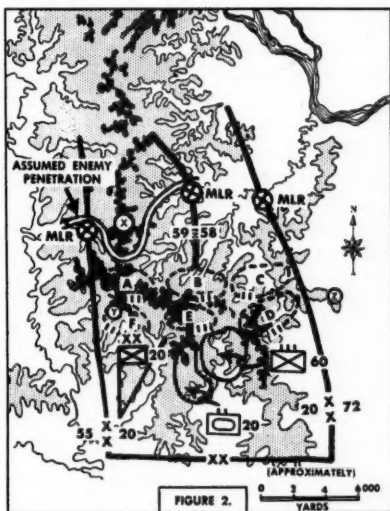
The *how* has been resolved, in part, by the graphic portion as indicated in Figure 3. This is the general scheme of maneuver which the division will employ. *Why* the counterattack? Its purpose is to reduce the enemy penetration and restore the battle position. Therefore, it should be noted that all elements of the decision—mission—have been provided for with the exception of, perhaps, some of the *how*.

What unit or units of the division are or will be available to constitute a counterattack force? First, consider the 60th Infantry—the only regiment not assigned a sector of the main line of resistance. This unit will garrison the General Outpost Line for the 20th Infantry Division, and upon completion of that mission will revert to division reserve as indicated in Figure 2.

The principal missions of the division reserve are:

1. Counterattack to restore the battle position.
2. Prepare defensive positions.
3. Occupy prepared positions as required to block enemy penetrations and to form a base of fire for counterattack.
4. Relieve units in the battle position.
5. Extend the flanks of the battle position.

The 60th Regiment, along with the 20th Tank Battalion, constitutes the division re-



serve and provides a strong, well balanced counterattack force. The decision is apparent, then, to select the 60th Infantry with the 20th Tank Battalion attached as the counterattacking force—placing all units of the counterattacking force under the command of one commander, the Commanding Officer of the 60th Infantry. A more detailed *who* has now been provided, namely the 60th Infantry Regiment, reinforced. Although the reserve regiment makes the main effort, it is supported by all other units of the division, and, therefore, it is definitely a *division counterat-*

tack, not an attack by the 60th Infantry. From the viewpoint of the division commander, the entire reserve is committed in the counterattack. A division reserve is reconstituted as units become available.

There still remains a small part of the *how* to be resolved. Many terms have been used in conjunction with the counterattack. Such terms as unity of command, unity of effort, command control, control, and operational control are but a few. It is generally believed that unity of effort means the concentrated effort by all units directed at a common mission. Unity of command provides for the over-all leadership and command authority necessary to achieve this unity.

It is a fundamental that every counterattack plan provide for unity of command in the zone of the counterattack. This can be accomplished by one or more of the following:

1. Physical presence and supervision of a higher commander.
2. Attachment of units in the area to the counterattacking force.
3. Execution of a passage of lines.
4. Adjustment of boundaries.
5. Organization of a task force.

As mentioned previously, the counterattacking force is placed under a single commander; however, additional measures to achieve unity of effort should include detailed fire plans, rehearsals, designation of boundaries or frontages to fix responsibility, avoidance of friendly defense areas, as well as provisions for unity of command in the zone of the penetration to ensure maximum effort on the part of all concerned.

It should be remembered that modifications are usually necessary before a counterattack plan can be placed into effect. Proper planning will reduce the number of changes necessary to a minimum. Having decided upon one of the five methods

listed above as a means to obtain unity of command in the plan, it may be necessary during the execution to make a modification—such as the attachment of a battalion, method 2 above, to the counterattacking force, which is executing a passage of lines, method 3 above.

In this situation, for planning purposes, the G3 has selected a passage of lines, method 3 above, as the best means to ensure unity of command in the zone of the counterattack. This operation, the passage of lines, is an offensive operation in which the regiments have engaged many times and has been reduced to a standing operating procedure in the division. In this example the 60th Infantry will pass through the 59th Infantry, seize the objective, restore the battle position, and assume defense of the sector. This can be partially shown graphically by indicating the 60th Infantry on the left side of the boundary in place of the 59th Infantry now shown (see Figure 3). With this action, the G3 has completed all elements of the mission. He has determined and indicated on the overlay the detailed *who*—60th Infantry, reinforced—and the balance of the *how*—passage of lines. G3 is now ready to prepare, in detail, the written portion of the order which will tell just what each unit is to do.

Operation Plan

An operational plan prepared for an operation to be conducted at some future time requires assumptions to be made in order that planning may progress. A counterattack plan is an operational plan which, when approved, is the basis for the operation order; or, the plan may become the operation order by appropriate instructions from the issuing headquarters. Plans are identified by a number or a name indicating the priority of the plan. Figure 4 is the counterattack plan for the hypothetical situation wherein the 20th Infantry Division, an interior division of I Corps,

has been directed to organize, occupy, and defend an assigned sector. The remarks made in the balance of this discussion will refer to specific parts and paragraphs of the operation plan. (See Figure 4.)

The heading contains a reference to changes from oral orders, if any, the copy number assigned to the plan, issuing headquarters, place of issue, date-time group, month and year of issue, message reference number, type and serial number of the

Situation

Paragraph 1, Situation, contains such information of enemy forces, friendly forces, and attachments to and detachments from the issuing unit that subordinates should know in order to co-operate effectively in executing their assigned tasks. This paragraph is devoted exclusively to information, and contains no part of the plan or instructions of the commander. It always contains subpara-

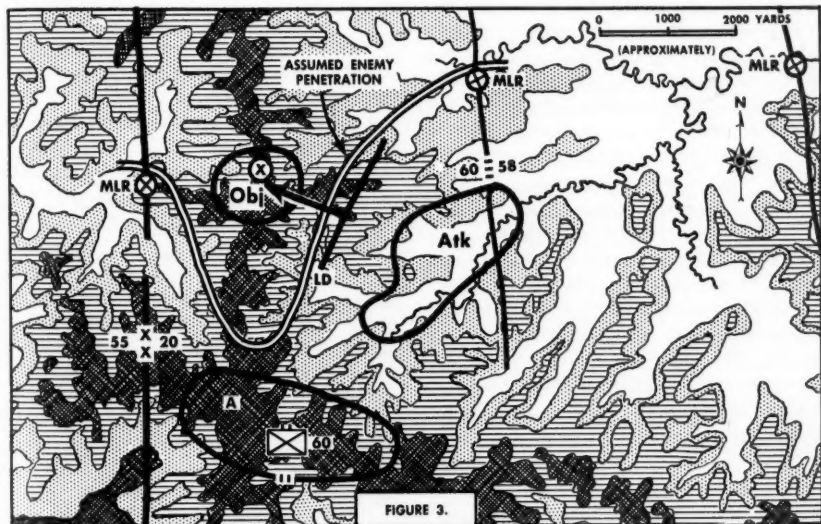


FIGURE 3.

plan, reference used, and the time zone used throughout the plan when required. Figure 4, Operation Plan 2, *Hijack*, has been prepared from the graphic material of this article. Operation Plan 2, when ordered into execution, would become the next Operation Order (OpnO 10), numbered progressively following the last Operation Order (OpnO 9) issued by the division. As stated before, there are several counterattack plans and the one ordered into execution would become the next Operation Order in line. Usually the counterattack plans are numbered or lettered in order of priority and preparation.

graphs a, Enemy forces; b, Friendly forces; and c, Attachments and detachments. It may include a paragraph d, Assumptions.

In this paragraph, the counterattack plan should include the latest enemy information and should invite attention to the latest Periodic Intelligence Reports (PERINTREPs) and Intelligence Summaries (ISUMs). The friendly forces information will usually be taken from the operations overlay to the operations order then in effect. The attachments and detachments will be taken from the troop list as maintained by the G3. Assumptions

for the counterattack plan usually will include a statement concerning the assumed enemy penetration and the sector in which it is located. In this case an enemy penetration in the sector of the 59th Infantry has been listed as an assumption.

Mission

Paragraph 2, Mission, contains a concise, written statement of the mission and the purpose of the entire command. Although the mission is shown graphically on the overlay portion or map, it is *always* written out in full. The statement of the mission will not include the designation of the unit making the main effort—in this case the 60th Infantry—but will refer to the division counterattack. Paragraph 2 will contain no subparagraphs.

"Division counterattacks H-hour, D-day, in the direction Hill X to reduce enemy penetration and to restore the battle position." This mission has included the *who*—the division; *what*—counterattacks; *when*—H-hour, D-day; *where*—in direction Hill X; *why*—to reduce enemy penetration and to restore the battle position. The *how* has been shown graphically on the overlay and will be described in detail in Paragraph 3. Although the mission normally includes most of the *how*, an exception is made in this example since there is but one maneuvering element and the order is clearly understood as written.

Execution

Paragraph 3, Execution, gives the overall concept of the operation. It assigns definite tasks or mission to each element of the command—organic and attached—which is charged with the execution of tactical details for carrying out the mission as set forth in Paragraph 2, including details of co-ordination and the organization for combat. In short, this paragraph gives the detailed missions to the subordinate commanders.

Paragraph 3a, a relatively new addition

to Paragraph 3, states a concept of the operation—an envelopment by the 60th Infantry to reduce the enemy penetration and restore the battle position. The priority of artillery and air support has been given to the 60th Infantry and permission for necessary preparatory fires has been granted to all units.

Paragraph 3b indicates that the 58th Infantry is to continue the defense of its sector. In short, there is no change but it is restated here to ensure understanding by all.

Paragraph 3c directs the 59th Infantry to:

1. Support the attack of the 60th Infantry.
2. Assemble division reserve in the vicinity of . . . when passed through by the 60th Infantry on division order.

The 59th Infantry has a twofold mission: first, it is to support the passage of the 60th Infantry; and second, on division order, and this of course will be closely co-ordinated with the 59th, it will be assembled in division reserve at the location designated.

Paragraph 3d covers the mission of the 60th Infantry which has attached to it for this operation the 20th Tank Battalion. It has been directed to:

1. Pass through elements of the 59th—herein we have the passage of lines as visualized by the G3.
2. Assume defense of the sector. This infers restoration of the battle position inasmuch as it has been assigned the mission of assuming defense of the sector.

Paragraph 3e assigns missions to the Division Artillery. The counterattack should always be weighted heavily with supporting artillery fires. Each of the direct support battalions has been given the initial mission of direct support of their respective regiments. In the case of the 59th, its normal supporting Field Artillery Battalion, the 78th, will reinforce the fires of

(Classification)

COPY No 2
20th Inf Div
(LOCATION)
270800 May 1954
RX 800

Opn Plan 2 (HIJACK)

Map: [TITLE, SCALE and SHEET]

1. SITUATION

- a. Enemy forces:
 - (1) Annex A (Intel) to OpnO 9.
 - (2) See latest PERINTREPs and ISUMs.
- b. Friendly forces. Annex B (Opn Overlay) to OpnO 9.
- c. Attachments and detachments. None.
- d. Assumptions. Enemy penetration sector 59th Inf.

2. MISSION

Div CATk H-hour, D-day in direction of Hill X to reduce enemy penetration and to restore the battle position.

3. EXECUTION

- a. Concept of operation. An envelopment by 60th Inf to reduce the enemy penetration and restore the battle position. Priority of Arty and air support to 60th Inf. Preparatory fires will be permitted.
- b. 58th Inf: Continue defense of sector.
- c. 59th Inf:
 - (1) Support Atk 60th Inf.
 - (2) Assemble Div Res vicinity . . . when passed through by 60th Inf on Div order.
- d. 60th Inf:

Atch: 20th Tk Bn.

 - (1) Pass through elements of 59th Inf.
 - (2) Assume defense of sector.
- e. Div Arty:
 - (1) 77th FA Bn: DS 58th Inf.
 - (2) 78th FA Bn: DS 59th Inf; GS; Comm, Ln, fire to Aval Sup rate to 79th FA Bn on Div order.
 - (3) 79th FA Bn: DS 60th Inf.
 - (4) 80th FA Bn: GS; Comm, Ln, fire to Aval Sup rate to 79th FA Bn.
 - (5) Be prepared to mass fires in sector 60th Inf.
 - (6) 20th AAA Bn: protect in priority 60th Inf Atk position, Div Arty.
 - (7) Annex C (Fire Support Plan) to OpnO 9.
- f. 20th Tk Bn: Atch to 60th Inf.
- g. 20th Recon Co: patrol and assist defending Div rear area and lines of communication against infiltration and sabotage.
- h. 20th Engr Bn:
 - (1) Support 60th Inf with one company.
 - (2) Be prepared to assemble on 3-hours notice vicinity . . . Div Res, prepared for combat employment.
- i. Div Res:
 - (1) 59th Inf: on Div order.
 - (2) 20th Engr Bn: on Div order.
- j. Co-ordinating instructions:
 - (1) This plan effective for planning on receipt; for execution on Div order.
 - (2) All other units except Med Bn prepare to assemble on 4-hours notice vicinity . . . for combat employment.
 - (3) Road priority to 60th Inf for movement into position.

4. ADMINISTRATION AND LOGISTICS

AdminO 4.

5. COMMAND AND SIGNAL

Annex D (Signal) to OpnO 9. Index 7, SOL.

Acknowledge.

Distribution: A

55th Inf Div
72d Inf Div

OFFICIAL:

/s/ Brown
BROWN
G3

LEWIS
Maj Gen

(Classification)

Figure 4.

the 79th when told to do so by division. The 80th Field Artillery is in general support with the mission of reinforcing the fires of the 79th Field Artillery Battalion. All fires are prepared to be massed in the sector of the 60th Infantry. The mission in 3e(6) to the 20th Antiaircraft Artillery Battalion is to protect in priority the attack position of the 60th Infantry and Division Artillery, while 3e(7) refers to Annex C, the Fire Support Plan to Operation Order 9—the operation order then in effect. It should be remembered here that any changes in the Division Artillery can be made immediately by the Division Artillery Commanding General.

Paragraph 3f indicates that the 20th Tank Battalion is attached to the 60th Infantry. The entire tank battalion should be attached to the counterattacking regiment to weight the counterattack.

Paragraph 3g assigns the 20th Reconnaissance the mission of patrolling and assisting in the defense of the division rear area and lines of communication against infiltration and sabotage. This is a very appropriate mission for the Reconnaissance.

Paragraph 3h to the 20th Engineer Battalion directs that it support the 60th Infantry with one company and be prepared to assemble on 3-hours notice vicinity . . . in division reserve, prepared for combat employment. This provides for early reconstitution of the reserve, and selects the engineer battalion as being the most eligible and next appropriate combat unit.

Paragraph 3i, division reserve, indicates that the 59th Infantry will be in reserve on division order—this is understood to be upon clearance and passage of the 60th through the 59th—and the 20th Engineer Battalion if and when directed to do so by division order.

In paragraph 3j are listed those items of interest to two or more organizations. In (1), it is stated that the plan is effective for planning on receipt; for execution on division order. In (2), it directs that all

units, other than the Medical Battalion, be prepared to assemble on 4-hours notice in the vicinity of . . . for combat employment. These units would be directed to assemble in division reserve according to a priority established, with the signal company probably the last unit so called. The commander is constantly faced with the problem of directing units to report to division reserve, thereby giving up all or nearly all of their support missions. In (3), road priority has been assigned to the 60th Infantry for movement into the attack position. This must be closely coordinated with front line regiments to ensure that the counterattacking force is not slowed or retarded in its execution of the counterattack.

Administration and Logistics

Paragraph 4, Administration and Logistics, contains a statement of administrative matters, including logistical arrangement applicable to the operation. When an administrative order is in effect or is to be issued separately as an annex to the operation plan, Paragraph 4 of the operation plan may consist of only a reference to the administrative order, together with any special administrative details which affect immediately and directly the tactical missions of the subordinate combat units.

Command and Signal

Paragraph 5, Command and Signal, contains instructions relative to command and operation of signal communication.

Paragraph 5a, Signal, refers to a standard plan or a signal annex when issued.

Paragraph 5b, Command, shows the location of the command post of the issuing unit. The locations of the command post of subordinate units, when known, or instructions directing subordinate units to report the location of their command post and time of opening, may be included, and, when desired, the location of the next higher headquarters.

CHECKLIST

1. Check the graphic portion (Figure 3) to ensure that the essential elements have been included and correctly indicated.

a. The blocking position has been drawn solid and shows the unit that is to occupy it.

b. The objective is a solid line goose egg marked Obj which is neither too small nor too large and does not extend beyond the limits of the assumed penetration. Its seizure and retention will restore the battle position.

c. Direction of attack strikes the enemy penetration on the flank and extends from the line of departure to or into the objective.

d. The line of departure is close to the assumed penetration and is correctly indicated as LD.

e. The attack position has been shown as a solid line goose egg marked Atk, and is neither too small nor too large. It utilizes the best terrain and is large enough to accommodate the force that is to occupy it.

f. The units that are going to be responsible for the sectors upon completion of the counterattack have been correctly shown.

2. Check Paragraphs 2 and 3 of the written portion to determine if they do in fact implement the scheme of maneuver depicted on the graphic portion. (See Figure 4.)

a. Paragraph 2, the Mission, states the *who, what, when, where, and why*. (The *how* is shown graphically.) It clearly stated that this counterattack is a division effort.

b. The 60th Infantry had been given priority for Air and Artillery support.

c. Unity of command in the zone of the counterattack has been provided for by means of a passage of lines.

d. The 59th Infantry has been ordered into division reserve on division order.

e. The *entire* tank battalion has been attached to the counterattack force, the 60th Infantry Regiment.

f. The 60th Infantry has been directed to pass through the 59th Infantry and restore the battle position.

g. The counterattack force has been weighted with artillery.

h. Priority for the antiaircraft artillery has been established.

i. A mission has been given to the 20th Tank Battalion.

j. An appropriate mission has been assigned the 20th Reconnaissance Company.

k. A mission has been assigned to the Engineer Battalion.

l. An early reconstitution of an adequate reserve has been provided.

m. The time that the plan is to be effective has been correctly stated.

n. Provisions for assembling all units of the division, less the Medical Battalion, as division reserve have been included.

o. Road priority has been assigned to the 60th Infantry for movement into the attack position.

p. The entire division reserve has been committed in the counterattack.

q. All units have been listed in their proper sequence.

Figure 5.

Paragraph 5c, Axis of Signal Communication, shows the axis of signal communication as indicated by successive, tentative command post locations.

Most of the items in Paragraph 5 can be and usually are shown graphically on the map or overlay. If such is the case, they need not be written out in Paragraph 5.

Ending

The ending contains acknowledgment instructions, the signature, a list of annexes if any, the distribution and the authentication. The original—file copy—is signed by the commander personally or by the chief of staff in the name of the commander, using the phrase, "By Command Of."

Checklist

Now that both the graphic and the written portions of the plan have been prepared, the G3 is about to check his work. Listed in Figure 5 are items which he should check to ensure that his counterattack plan, both the graphic and written portions, is clear and that it does provide for the accomplishment of the counterattack as he visualizes it.

The checklist, although brief, contains the important considerations for a counterattack plan. Experience and close staff coordination with subordinate commanders will provide, over a period of time, a smoothly working organization—one which will develop and issue plans readily and easily understood by all. Throughout this article reference has been made to the G3

as the originator of the counterattack plan. It must be remembered that approval for all plans and orders rests with the Commanding General or his representative.

Summary

The counterattack is the decisive element of the defensive. It is a plan which contemplates the single co-ordinated blow delivered by as large and strong a force as the situation and terrain will permit—with the mission of destroying or ejecting the enemy from the battle position. Counterattacks are required when an important locality is lost or threatened or a dangerous gap is created in the line.

In the execution of the counterattack plan, the commander must remember to commit the entire reserve to the counterattack. He must provide for unity of effort in the zone of the counterattack and for an early reconstitution of the reserve.

The counterattack is an offensive operation conducted from a defensive situation. The plan for the counterattack is prepared in the same manner as an operations plan and can become an operations order when so directed by the issuing headquarters. It should be remembered that it is prepared in detail and, time permitting, rehearsed.

Providing the planning has been correctly and properly accomplished, counterattack plans can be placed into effect with the minimum of modifications or changes. Its execution should be violent.

AUTHORS

Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

Food and War

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

PICK up any newspaper any day of the week and an item of military preparedness in one form or another is sure to be in evidence. It may be next year's draft call, or the latest tank production figures, or a new experimental model plane or gun. It will always be an item which the bulk of the readers will want to look upon with some degree of understanding and enthusiasm and therefore must be limited to the more dramatic aspects of warfare. The result is a rather thorough coverage of one phase of military preparedness—mobilization of arms and men—and an almost wholesale neglect of a second but by no means less important phase, economic mobilization.

Of the many aspects of economic mobilization—probably the least written about, talked about and known—are those concerning the wartime mobilization of food and agricultural resources. There is no time like the present to look into the modern history of this subject with an eye to the future.

The United States, like the European countries of the twentieth century, planned for war emergencies on the basis of his-

torical events and experiences. Prior to World War I the wars of the preceding half century had been comparatively brief. Military minds of Europe wrote, planned, and continually emphasized the necessity for the lightning mobilization of troops and the advantage of "getting there fastest with the mostest." Succeeding in this, it was thought, would throw the enemy completely off balance and result in a quick victory. Furthermore, there was considerable doubt among the strategists as to whether any nation could overcome the financial strain of supporting itself a long period of time under arms. As a result, planning prior to the outbreak of World War I encompassed purely military matters.

In spite of the fact that Europe had been at war for almost 3 years before the entry of the United States, we were as totally unprepared in 1917 as we had been in 1914. We failed to put to use the experience of the countries of Europe. We failed to realize that the prime characteristic of this war was the extent to which it involved material resources of the participating nations.

Not until March 1918—after almost a year of belligerence—did the American economy assume a relatively stabilized and workable form.

Referring to the first 4 months of our existence as a belligerent, Bernard M. Baruch testified, "During all this time

Our experiences in World War II and the postwar era made us realize the importance of food in military economy. The role of the American farmer in the over-all picture of security is becoming a consideration

there was the greatest confusion imaginable. They did not even know what materials were necessary to equip an army. . . ."

Initial Action

The first important action taken toward meeting the economic problems of the war was the provision in the Army Appropriation Act of 29 August 1916, for the establishment of the Council of National Defense. Section 2 of this act stated in part, "That a Council of National Defense is hereby established for the co-ordination of industries and resources for the national security and welfare. . . ." The Council was to consist of the President's Cabinet and was given advisory powers only. It was to be aided by an advisory commission consisting of seven members appointed by the President. Each member was to be especially qualified for some particular line of endeavor, either in industry, public utilities, or in the development of natural resources. These men were to serve without compensation.

Within the Council, committees were formed in response to different needs as they arose. In the course of development there was organized a committee on transportation, on coal, on food, on shipping, and others. From these there eventually arose—by act of Congress—the Railroad Administration, the Fuel Administration, the Food Administration, the Shipping Board, and War Trade Board.

By July 1917, the appearance of shortages and rising prices manifested the necessity of broader control. The result

was the creation of the War Industries Board by the Council of National Defense. The functions of the Board appear as follows: (1) to establish a system of priorities to eliminate shortages in certain commodities, (2) to fix prices, (3) to analyze the needs of our Government, of the allies, and of the civil population, (4) to study the extent to which our resources could meet these needs, (5) to provide means and encouragement for increasing production, and (6) to make rules and offer suggestions for preventing waste and unnecessary use.

On 4 March 1918, the powers of the War Industries Board were reorganized and expanded and Bernard M. Baruch became chairman with complete personal power of decision.

The Food Administration

On 3 May 1917, Herbert Hoover returned from Europe with the urgency for increased food exports clearly impressed upon him. In that same month he was appointed Food Administrator. However, not until the passage of the Lever Act on 10 August 1917 was the legal framework provided for government control over foods. This framework was produced in the form of the Food Administration.

The Food Administration was created, not to tackle any particular problem but, as its general title indicates, it was committed the responsibility of meeting situations as they arose. Its function was to aid the war effort and at the same time protect the long-term interests of producers and consumers. It proceeded with reliance upon the ability and willingness of our people to adjust their behavior to the needs of the nation without autocratic control.

One of the first problems which confronted the Food Administration arose from the demand for wheat abroad. It was faced with one of three alternatives. It could allow the enormous purchases of

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our allies to increase the price of wheat at the cost of untold suffering among our poorer classes, it could institute a system of compulsory rationing, or it could appeal to the people for conservation by substitution, thus freeing more wheat for our allies. The latter course was chosen. A pledge-card campaign among the nation's women was successful in releasing, from domestic consumption, 130 million bushels of wheat for export by June 1918. That represented almost 93 percent of all wheat exported during this period.

Similar policies were followed with meat and resulted in the export each month of five times as many pork products and twelve times as many beef products as in normal times. Meatless Tuesdays, porkless Saturdays, and one meatless meal a day, were the slogans which brought about these successes.

Minimum Price

The Food Administration attempted to maintain a minimum price in order to increase production in certain commodities. This was not an absolute promise on the part of the Government but was based merely upon the belief that purchases by the Army and our allies would automatically keep the price above the point specified. The policy was successful and the integrity of the Government was upheld by the existence of a price above the minimum specified.

The Food Administration licensed packers under a food control law and limited the profit of the five largest packers in their meat departments to 9 percent on the capital employed. This was done to pacify consumers who felt that high meat prices were the result of extortionate packer profits.

A Meat Division was established by the Food Administration to handle problems dealing with the livestock and packing industry. The purchase of all meat sup-

plies for the allies was finally centralized in this division. It resulted in a better adjustment of purchases to meet the actual needs and avoided duplication of effort.

From the previous discussion it can be seen that the mobilization of food and agriculture in World War I was a gradual and somewhat leisurely process. Control was, in many instances, indirect and in some instances nonexistent. The program was late in getting started and probably owes whatever success it had to the short duration of the war.

Unlike other fields of activity, lack of planning for the mobilization of food and agriculture may not be attributed entirely to a lack of foresight. We had never known what a food shortage was. Ours was the land of plenty; a land to which millions of foreigners flocked from areas of famine. Our problem was not shortage but surplus. Had the necessity of feeding our allies not arisen, we very probably could have refrained from any regulation in the agricultural field throughout World War I.

The end of the war removed this temporary state of affairs and turned the attention of our agricultural leaders once more to the welfare of the farmer. During the 'twenties, surpluses accumulated, farm prices declined, and the plight of the farmer became serious. In the 'thirties, the Government made a determined effort to raise farm prices and decrease farm production.

World War II Planning

Agricultural planning for World War II—if it may be called planning—manifested itself in this indirect way. It arose as the result of the natural and ever-present problems of the United States farm industry and the necessity for peacetime aid to prevent the complete demoralization of the farmer.

The outbreak of the war found more

than 10 major institutions assisting the farmer. These included research divisions of the Department of Agriculture and State Agricultural Experiment Stations, the Farm Credit Administration, the Soil Conservation Service, the Commodity Credit Corporation, the State and Federal Extension Service, the Agricultural Adjustment Administration, the Farm Security Administration, the Surplus Marketing Administration, and the Rural Electrification Administration. Most of these were within the Department of Agriculture. In addition, there were a number of other public programs primarily concerned with the problems of agriculture. Among these were the Forest Service, the Federal Crop Insurance Corporation, and the Vocational Training Program. These peacetime programs of research, education, credit, and conservation indirectly contributed to agriculture's ability to respond to our war needs.

Lack of Vision

In the field of direct planning, unfortunately, we find a very definite gap. The only evidence that activities in the predefense period were planned, with the possibility of armed conflict in mind, lies in the statements of Henry Wallace before the Committee on Commerce of the United States Senate. In answer to questions from the Committee, Mr. Wallace pointed out the general lack of foresight and vision which resulted, among other things, in a failure to stock-pile certain strategic materials.

He emphasized one exception to this. In April 1939, he arranged with the State Department for an exchange with Great Britain of 600,000 bales of cotton for 90,500 long tons of rubber—enough rubber to make 20 million tires.

In addition, Mr. Wallace intimated that as Secretary of Agriculture, the stockpiling of agricultural products for an emergency was a policy which he unoffi-

cially maintained. He added that he did not openly advocate the accumulation of surplus cotton for war emergencies because he "knew it would be an unfortunate argument to use." This last statement is evidently a reference to the state of American public opinion at the time—a factor which played a very important part in the lack of preparedness.

In May 1940, the first definite step was taken in recognition of the importance of agriculture in the defense program. Chester C. Davis was appointed by President Roosevelt to represent agriculture's interests on the National Defense Advisory Commission. Here—where plans for mobilizing defense industries and the utilization of scarce supplies of strategic materials were discussed—Mr. Davis attempted to integrate agricultural problems and requirements with the general mobilization plan. He advocated the location of new plants in areas of surplus agricultural population. He presented agriculture's requirements for machinery and supplies, and he undertook an inventory of food processing and storage capacities. His recommendation, that a food administration be organized to mobilize the resources of agriculture and the food processing industries for possible war needs, was rejected by the President because it represented a move for the preparation for war rather than being a "defense" measure. As was previously stated, however, such a step would have been unacceptable to the American public.

Prevention of Surpluses

Toward the end of 1940 and during the first few months of 1941 the administration began to realize that the world situation would soon force it to take positive action in the agricultural field. The first such step was taken in December 1940—until this time the general policy still had been directed at the prevention of surpluses. Now—convinced that consumer

demand was expanding—the Secretary of Agriculture revised the hog breeding plan for 1941 upward. The original plans had called for a reduction in the number of hogs for 1941—over 1940. The revised plan brought the number back up to the 1940 level. The passage of the Lend-Lease Act on 3 March 1941, placed a further demand on existing supplies and the Department of Agriculture became convinced that a more general increase in production would be needed. The British demands for meat (especially pork), dairy products, eggs, canned vegetables, and dry beans brought about an immediate need for increased production of these commodities. The Department of Agriculture now began to offer economic incentives to ensure successful response from the farmers.

Food Requirements

Throughout 1941 and 1942—as the symptoms of the emergency became more obvious—the Department of Agriculture gradually increased its demands upon the farmer. Production goals set up in September 1941—for 1942—were later revised upward and price supports and higher loans were provided for the five basic crops—corn, cotton, wheat, rice, and tobacco. Foreseeing possible cessation of imports, the Department of Agriculture moved to increase the domestic production of such vital agricultural items as garden seeds, fiber flax, hemp, and castor oil. A general pattern of production goals and related price supports was gradually developed and followed throughout the war.

At the same time that agriculture was gearing for increased production, the administrative agencies concerned were undergoing constant change. On 5 May 1941, the Office of Agricultural Defense Relations was created. It was to serve as a co-ordinating unit between the Department of Agriculture and the new defense agencies. In July 1941, the work of vari-

ous agricultural agencies on state and county levels was unified by merging them into Defense Boards for the joint consideration of state and county problems. These later became War Boards. On 5 June 1942, the Secretary of Agriculture was named chairman of a Food Requirements Committee. Created within the War Production Board, this Committee included, in addition to the Secretary of Agriculture, representatives from the War Production Board, Office of Price Administration, Military Services, and other Government agencies. The Committee was created to consider the problems of the volume of food to be produced, how it was to be allocated, and what production materials were needed.

The entire program was linked to the international situation through the Combined Food Board. Created in June 1942, it was designed to co-ordinate the production, allocation, and utilization of the food resources of the United Nations. The Board was established by President Roosevelt and Prime Minister Churchill. It consisted of two members—one British and one American—and a staff of combined British and American food specialists.

Among the numerous arrangements handled by the Board was one under which the British Ministry of Food became the sole purchaser of all meat available from Argentina, Brazil, Paraguay, and Uruguay. These supplies were then distributed among the allies, according to the recommendations of the Board.

This policy made possible the orderly allocation of South American meat and a more efficient use of shipping space.

The Combined Food Board also worked out an arrangement for the shipment of concentrated phosphate fertilizer to the United Kingdom, thus enabling the British to grow more of their own food by increasing yields per acre. This decreased the amount of food the British had to

import. Research in 1943 revealed that, properly used, the fertilizer produced three times as much additional food as could be sent in the shipping space required for the fertilizer. Thus, the Combined Food Board played a valuable part in utilizing to the fullest the resources of the world and relieving some of the pressure on United States agriculture. The lack of centralized authority to deal with the food problem led to the creation of the Food Production Administration within the Department of Agriculture in late 1942. A few months later further centralization was realized in the establishment of the War Food Administration with Chester C. Davis as its chief.

However, throughout the war period, control of materials—including metals used in making farming machinery and in food processing—remained with the War Production Board and the Office of Price Administration controlled the rationing of fuel and tires, prices, and food distribution at the retail level. Walter W. Wilcox in his book, *The Farmer in the Second World War*, summed it up neatly when he said: "Our agricultural economy was brought into full war production without the benefit of . . . an agricultural administrator with wide powers in the food field."

World War II Production

The increase in production of agricultural products during the war was achieved without a substantial increase in the acreage and production of the basic crops. Thus, although the acreage seeded in wheat was 62,000 in 1939, and 69,000 in 1945, production increased from 741,000 bushels to 1,108,000 bushels in the same period. On the other hand, because of decreased imports and increased demand, the production of certain oil-producing plants was increased tremendously. For example, in 1938, 905,000 acres of flaxseed were harvested. By 1943, this had

risen to 5,847,000 acres. The major incentives for increasing production of needed commodities were favorable prices. However, price incentives were reinforced by educational programs conducted by the Extension Service and the Agricultural Adjustment Administration and special credit facilities made available by other agencies of the Government and by local banks. Supplies, such as fertilizer and machinery, were allocated by Government officials so as to facilitate the attainment of goals in specified products.

Fertilizer

Possibly one of the most important aspects of the farm production problem was that concerning fertilizer supply. In 1941—before the United States had entered the war—the Agricultural Adjustment Administration entered into contracts with several companies which produced superphosphate. The contracts called for the Agricultural Adjustment Administration to take over all unsold supplies and to distribute them through its own program. As a result, the phosphate fertilizer industry continued to operate at near capacity during the months preceding Pearl Harbor.

Governmental supervision was necessary throughout the war to keep the industry operating at full capacity. High priorities were established for the fertilizer industries. The increase in total fertilizer production can be seen by a comparison of the 1939-44 figures for total fertilizer used. The use of lime and liming materials rose from 5,900,000 tons in 1939 to over 19 million tons in 1944. In addition, nitrate of soda imports from Chile were kept near peacetime figures despite the acute shipping scarcity.

Despite the increase in fertilizer production, by 1942, the demand for nitrogenous fertilizers exceeded the supply at the prices established by the Office of Price Administration. Steps were taken by the

War Production Board to cut down on the use of such fertilizers for nonfarm purposes. Utilization of nitrogenous fertilizer on lawns, golf courses, and certain nonessential crops was forbidden. In this way it was possible to channel the much needed fertilizer and liming materials to those crops which were most important to the war effort.

Farm Machinery

A second important aspect of the agricultural production program was the problem of supplying the necessary farm machinery. In 1942 and 1943, this problem, along with the one of supplying repair parts, became acute. In 1942, production of new farm machinery was 83 percent of the 1940 production. The steel allocated to farm machinery production for 1943 would have resulted in a drop to 23 percent of the 1940 figure, but, after considerable protest by the Department of Agriculture, the steel allocation was raised to 40 percent of 1940.

In November 1942, a rationing system was finally devised and adopted for the allocation of farm machinery. Machinery was to be directed from manufacturers to dealers on the basis of area needs in meeting specific national food production goals. Farmers were required to obtain purchase certificates from their County War Boards in order to buy a new machine. The system brought many complaints from all concerned. This dissatisfaction—along with an improved steel and machinery production situation and the belief that the war in Europe would end soon—brought about an abandoning of the rationing program in November 1944. Despite the tight steel situation, the number of new farm machines of all types increased substantially during the war years. One million tractors alone were purchased by United States farmers in the period 1941-45.

Increased food production and a neces-

sary decrease in imports created, among other things, a scarcity of vital insecticides and fungicides. The fall of Singapore, for example, cut off one-half of our supply of very valuable insecticide found in rotenone-bearing roots. The Bureau of Entomology and Plant Quarantine embarked on a program of distribution which would result in the utilization of these scarce materials so as to maximize their effectiveness in insect control. There was no formal rationing system, but manufacturers—under arrangements with the War Production Board and later the War Food Administration—filled shipments to those areas most in need. This method of control turned out to be quite effective.

Throughout the period of agricultural production planning, nutritional needs as well as market requirements were considered. Thus, in recognition of the high nutritional value of dairy products, the demand for such things as evaporated milk and cheese greatly increased. Combined lend-lease and military demands soon exceeded available supplies. In October 1943, a dairy feed-subsidy program was inaugurated by the War Food Administration to counteract the decrease in fluid milk production. Under this program, farmers were paid a bonus based on the pounds of milk or butterfat delivered to processing plants. The movement for improved nutrition was also a factor in the rapid expansion of milk dehydration facilities. Dried milk consumption in 1941 was 347 million pounds—in 1945, it was 653 million pounds.

Scarce Supplies

In allocating the scarce factors of production and in the planning of production on a national scale, the goals in themselves were subordinated to their comparative importance. It was important to fulfill goals in some fields of production and less important in others. To exceed goals in some cases meant a waste of precious

labor and supplies. By control and incentives, the Government swung its weight from one item to another as the comparative importance changed.

In spite of this, there were gaps and shortcomings in the production program. Some growers—for lack of incentive—switched to more profitable production. Thus, sugar beet growers gradually decreased the acreage planted in sugar and turned to potatoes, beans, and other crops. In 1942, sugar beet acreage was 954,000. By 1943, it had decreased to 548,000 acres. The goals set for sugar production were not being met. By 1945, a world sugar shortage existed. The War Food Administration and the Extension Service, through a program of publicity, and by promising growers that the necessary labor would be supplied, managed, in 1945, to increase sugar production in the United States by 12 percent over 1944. A somewhat similar problem arose in flaxseed production, but incentive payments increased acreage 20 percent in 1945.

The Labor Problem

In some such instances, the proper action was not taken. Certain nonessential crops continued to be grown, using up labor, fertilizer, and machinery at the expense of essential production. The melon industry is an excellent example. No ceiling price had been put on melons. From 1942 to 1943, the price of melons rose almost 100 percent. Cotton furnishes us with another example of misused resources. Production, although decreased, was maintained at a higher level than was needed. There was a particular need for long staple cotton, however, the resources used in the production of short staple cotton could have gone into the production of peanuts, vegetables, feed, and livestock.

Commercial agriculture is normally a labor surplus industry. Consequently, the only consideration given to farm labor

during the early part of the war was in December 1941, when a memorandum from Selective Service Headquarters to local boards stated that agricultural workers were to be deferred on the same grounds as industrial workers.

In the summer and fall of 1942, commercial agriculture abruptly shifted from a labor surplus to a labor deficit industry. In November 1942, when a bill to lower the draft age from 21 to 18 was under consideration in the Senate, Senator Tydings of Maryland added an amendment which called for the deferment of all men engaged in agricultural occupations. Thus, agriculture was singled out as an industry so important that the deferment of workers in that industry was made statutory. Deferment in other occupations was discretionary.

As a guide for local draft boards in determining the essentiality of farm workers, the Department of Agriculture prepared a list of war units or work requirement standards. The care of one milk cow, for example, was considered one war unit. Three beef cows or five yearlings were required for one war unit. From October 1942 to February 1943, a worker, to be deferred, had to be responsible for the production of only eight war units. Thus, a man caring for eight milk cows could be deferred. As the demand for men in the Armed Forces increased, however, requirements were raised. In February 1943, the minimum number of war units warranting deferment was increased to 10; in May of the same year it was increased to 12, and later to 16 units.

Throughout the war period, the classification of men deferred for agricultural pursuits ranged between 1,500,000 and 1,750,000. Although these men accounted for only 12 to 15 percent of the total farm labor force, they were young and able-bodied, and contributed a far higher percentage of the total work.

The farm labor program was not limited

to deferment of able-bodied males of draft age. Under the active supervision of the Farm Security Administration all available farm manpower was utilized to maximize its effectiveness. Since 1936, the Farm Security Administration had been handling migratory labor in addition to its education and rehabilitation programs. Charged with the responsibility of utilizing the manpower among small farmers for food production, the Farm Security Administration attempted to supply workers and tenants from among farmers who were underemployed to areas where shortages existed. In 1943, it operated 95 labor supply centers in seasonal crop areas, and provided housing, health, and sanitary facilities for seasonal workers.

This practice of the Farm Security Administration of moving farmers around the country met with considerable Congressional resistance, and, in March 1943, the Secretary of Agriculture created an Agricultural Labor Administration to deal with the farm labor problem. Two months later this was replaced by an Office of Labor.

The Office of Labor undertook to follow a program more to the liking of Congress. It assumed the responsibility for importing foreign labor and transporting domestic laborers who required Government transportation. The Office paid all transportation and subsistence costs for foreign workers. In order to obtain the consent of foreign governments, it was necessary to guarantee foreign workers minimum wages, housing, and health facilities. These guarantees were made a part of the employer's obligation when hiring the foreign labor.

The farm labor situation was further eased by the policy of camp commanders, on occasion, of issuing passes to soldiers who wished to assist with farm work during critical harvest periods. In addition, many laborers moved voluntarily from areas of surplus labor to areas of scarcity, thus relieving the Government of both

the responsibility and the embarrassment involved in moving them. In its entirety, the farm labor program was successful not only in accomplishing the basic job of relieving acute shortages, but also in accomplishing this with a minimum of discontent on the part of farmers, farm leaders, and Congressmen.

Marketing and Distribution

Before the war the marketing and distribution field was plagued with excesses and inefficiencies. There existed duplications of assembly and distribution facilities, excess capacities in the food processing field, excessive numbers of small, uneconomic processing plants, and a lack of grading and standardization of many products. In addition, there were arising increasing barriers to interstate trade in the form of discriminatory legislation.

When the war started, some of these problems became assets. Thus, although the quantities of food in cold storage during the war almost doubled, the capacity of cold storage facilities increased only 7 percent. Similarly, the production of products requiring elaborate processing facilities was increased tremendously with very little increase in plant capacities.

All Government purchases for military and lend-lease requirements were made subject to Federal inspection of the items purchased. Because of the increased Government buying, Federal inspection and grading expanded rapidly to many products. In 1943, the Office of Price Administration made Government grading of all lamb, beef, and mutton mandatory. The fact that Office of Price Administration price ceiling differentials were based on Government grades further expanded the use of the Government grading service.

This increased use of grading and standardization of products was continuously resisted by the trades concerned. In those cases where no grade differentials in the ceiling prices were specified, the produc-

ers of inferior goods were able to obtain prices equal to those secured by higher quality products which resulted in a decline in the average quality of the total amount produced.

When price ceilings were placed on food products in 1942, it soon became evident that consumer rationing would be required to assure equitable distribution of food. The Office of Price Administration and Civilian Supply was given original responsibility for the management of civilian supplies. When price control legislation was passed in January 1942, the Office of Price Administration was divided into three main operating branches: price control, rent control, and rationing. In the delegation of authority and responsibility regarding distribution, the War Food Administration assumed the job of determining what supplies were available for civilians—including the designation of those foods to be rationed. The Office of Price Administration rationed the supplies made available by the War Food Administration. The problem of food allocation within the United States was further aggravated by the demands of our allies and liberated people. The War Food Administration was not able to estimate accurately the future food needs of these people. Information from the military forces regarding stocks which they had on hand abroad was not forthcoming. The War Food Administration had to prepare for the feeding of our allies and the peoples of liberated areas with very few and conflicting estimates of the possible needs.

In late 1943 and 1944, a lack of cold storage facilities arose and it became difficult to accumulate reserve food stocks during a period when record yields were marketed.

Our demobilization and postwar policy was being formulated at this time under the pressure of the problems just men-

tioned. In addition, an inherent fear of postwar surpluses dictated many decisions. In September 1944, the War Food Administration outlined its policy of buying and stock-piling only those foods for which it had a definite outlet. It also began to give increasing attention to marketing problems which might arise in the postwar period.

Foreign Relief

The problem of foreign relief needs came more and more to the forefront in 1944. Plans were developing for a United Nations Relief and Rehabilitation Administration. A relief and rehabilitation section was established in the State Department 12 months before the international organization was completed. At the same time, the Army was assuming responsibility for necessary relief feeding following military operations for a period as long as 6 months. As already mentioned, attempts to get accurate estimates of future food requirements for relief needs were not too successful.

In the meantime, the War Food Administration was dropping one food consumption restriction after another in the summer and fall of 1944, for fear of accumulating surpluses. With the war emergency practically over in 1945, the public was demanding a reduction of exports and the removal of ration controls. Rationing was breaking down for lack of staff as more and more Government employees quit their positions for peacetime jobs. Lend-lease was abruptly terminated and no other arrangements for financing food shipments to our allies were made. Food rationing controls were finally dropped altogether, and the Department of Agriculture continued its policy of purchasing only those foods for which it had definite orders, backed by satisfactory financial arrangements. Throughout the fall of 1945, purchases for export shipment were almost nonexistent.

Famine and Europe

It was during this period that the famine situation was developing in Europe. Conditions became so critical in 1946 that it has been referred to by some as the greatest famine in the history of the civilized world. This may be somewhat exaggerated but there was, nevertheless, untold suffering. Our policy of preventing the accumulation of surpluses found us totally unprepared to prevent the misery which engulfed Europe in the winter and spring of 1946. Adequate food supplies might very well have provided the answers to the political questions which plagued postwar Europe.

Future Outlook

A discussion of the place of food and agriculture in war would not be complete these days without a look into the possible effects of modern weapons on our agricultural resources. The development of more deadly weapons and the maintenance of larger armies and well-organized reserves indicate that the speed of mobilization of manpower will no longer be the determining factor in war. As nations become more equal in potential power and maintain that power in readiness for an emergency, the likelihood of swift military victories disappears completely. It evidences, rather, the possibility of a static struggle. Should this develop, the real test of strength will come, not on the battlefield, but on the home front.

We are dealing then with total war. We are dealing with armed conflict between sovereign states represented not only by armed men in uniform but sponsored and waged by a society in arms. Total war is designed to destroy a nation completely. It is unrestricted in its means. The entire population and territory is exposed to its terrors.

The lessons learned in World War II are already somewhat outdated. The weapons supplied by modern technology, psy-

chology, and economics were merely undergoing tests in the past war. We must expect them to be much more developed in the next conflict and plan to meet them as they may be, not as they were.

Changes

Much of the planning for future destruction is centering upon an industry which heretofore had been comparatively invulnerable in the United States. Our agricultural industry has not had to think about destruction during wartime. Not since the Civil War have armies struggled on our continent. When the farm lands of the world were being destroyed by combat troops, our farmers enjoyed complete security in their work.

We must expect the total war of the future to change this. Modern technology has destroyed the security of our agricultural areas. It is still unlikely that any large-scale combat will take place in the center of these United States, but other forms of destruction are quite possible. I am referring specifically to incendiary and biological warfare.

Incendiary attacks on our grain fields just before harvest, if carried out on a large scale and on continuous periods of growth, could have serious consequences in the long run. Such an attack has occupied the mind of an aggressor. The Japanese had this in mind when they sent aloft incendiary balloons. More effectively, these attacks could be carried out by men parachuted from enemy planes or by the dropping of incendiary bombs. The success of such operations is made more likely by the fact that the areas are large and the manpower, particularly during wartime, is dispersed and depleted. Taking into consideration wind and weather conditions and the status of growth of the crops in specific areas (all of which can be determined accurately), an enemy could raise havoc with our grain crops.

Another and even more important threat to our agricultural areas arises from the development of biological warfare. Diseases spread among farm animals, farm crops, and even farm populations, can be very effective in cutting off the food supply of a nation. Such diseases do exist. The usefulness of cattle may be destroyed by such things as rinderpest, hoof and mouth disease, hemorrhagic septicemia—similar to the plague in man—and pleuropneumonia. Hogs are subject to hog cholera and poultry are susceptible to fowl plague and Newcastle disease.

In addition, there are diseases which affect both animals and man. Anthrax will infect cattle, sheep, goats, pigs, horses, and man. It is a bacteria which lives in the soil and, once introduced, would remain indefinitely, producing death in susceptible animals. Botulism—also affecting both man and animals—is spread by means of a toxin produced in food. In addition, we have such things as glanders, brucellosis—or Bang's disease—Rift Valley fever, teclaremia, and very probably many others. Fortunately, in the case of most of these diseases, preventives and cures are known.

However, this does not preclude the possibility of their utilization. Whether they are used and which ones will be used will probably be determined by our ability to control the various epidemics which may result. Dissemination of the poisons and bacteria will probably be ar-

ranged by fifth columnists or saboteurs. Contamination from the air is a possibility. Likely targets would be animal pasturage or feeds, other crops and, very definitely, water.

Much of what has been said on the subject of biological warfare may already be outmoded. Elaborate top secret projects for the development of biological warfare are in operation throughout the world and have been for many years. The importance of this new field of warfare is manifested by the fact that the United States alone has, in addition to various research centers, a permanent army installation for the development of offensive and defensive weapons of biological warfare.

The role of the American farmer in the over-all picture of security is becoming more and more the subject of our concern. Our experiences in World War II and the postwar era made us realize the importance of food in the military economy. More significant is the fact that we have begun to realize the importance of a physically healthy nation. A healthy body is conducive to the existence of a healthy mind, and a healthy mind means a good citizen. In this era of political turmoil and clashing ideologies, of the atom bomb and the cold war, the burden of maintaining our way of life and of relieving the pain and distress of peoples throughout the world rests more and more upon American agricultural resources.

It seems intelligent and essential that there be continued in time of peace the proved framework of an organization comparable to the War Production Board which will be constantly available for a time of emergency and which will draw on the store of experience, good will, production technique, research technique, and planned co-operation between the Armed Forces on one hand and private industry on the other. This liaison should never be allowed to die.

Secretary of Defense Charles E. Wilson

ROTATION

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

SINCE World War II, much has been written and spoken concerning the subject of rotation. It appears that the word "rotation," as well as the actions involved in the effective rotation of personnel, are not thoroughly understood throughout the Army. The author is referring to the movement of personnel from duties involving intimate daily contact with the enemy to duties in rear areas in which the possibility of injury or death—as a result of enemy action—is lessened.

Experience Gained

Experience gained during World War II proves, beyond any doubt, that a combat soldier has a limit of endurance beyond which he should not be exposed to continued frontline combat.

In addition to this limit which the human body and mind have for the physical and mental strains involved in combat, the frontline soldier should also be given a reasonable chance of survival. Knowledge that—after having honorably completed a prescribed number of combat days—he will be relieved from frontline combat should do much to alleviate some

of the fears expressed by the combat veterans of World War II.

During the Korean action, a rotation system was developed which kept the units in Korea constantly in the business of training and orientating new personnel. The rotation plan was expensive in manpower and dollars, but it may have paid its way in experience and morale. Because of the manpower cost involved, it could not be supported during a full-scale mobilization. Korea, then, was an abnormal situation insofar as rotation of personnel was concerned.

Paragraph 180 of Field Manual 101-1, *The G1 Manual*, although not specific as to type, states that during a full-scale mobilization, a rotation program of some type will be announced. It may be considered that there are two broad types of rotation which should be discussed: intratheater and intertheater. During the Korean operation a combination of the two types was in effect.

Need and Cost

Let us consider, first, the need and the cost of rotation. Need can be approached from either the manpower conservation standpoint or from the moral aspect. From the moral aspect let us consider the way in which a man drafted into the service gets to be a frontline combat soldier. He is inducted, given physical and mental tests, and, based on the results of these

There is no consistent reason why—in the event of war—our frontline riflemen and weapons crewmen could not be given some reasonable assurance of completing their military service without being casualties

tests and the needs of the service at the time, he is assigned to training in either a combat arm or service branch. Assigned to training in a combat arm, he may be in the artillery, armor, or infantry. If trained in the infantry, he may eventually find himself in a rifle company or heavy weapons company or in the headquarters or service units at battalion, regiment, or division level.

Only a small percentage of the men inducted into the Army end up in rifle and weapons companies performing frontline combat duty. Yet, it is this small group which suffers the greatest percentage of casualties. Based on World War II tables, it is possible to statistically predict the date, after entering combat, on which none of the original members of a rifle company will remain with the company without having sustained a serious wound. The combat soldier can observe and note this statistical fact.

Pure chance and the proper scores on tests place an inducted man in the frontlines of combat. That soldier who, by chance, finds himself day after day facing serious injury or possible death may well ask himself, "Why did this happen to me?" It does not seem logical that chance alone should play such an ultimate part in a man's life. The Army, then, is morally bound to provide a reasonable chance of survival to those individuals selected for frontline combat service.

From the standpoint of cost, World War II experience provides some interesting information. It is a generally accepted fact that losses among men recently committed to combat is higher than among

combat veterans. However, by closely analyzing the loss rates of veteran combat units during World War II, it appears that after an extended period of time in combat the loss rate of veterans becomes greater than that of new replacements. The only study which has been located dealing with this factor was made by the United States Fifth Army in Italy and resulted in the graph shown in Figure 1 on page 33.

As a matter of interest, the point at which the loss rate of combat veterans became greater than that of replacements was in the vicinity of 185 regimental combat days. This one example cannot be accepted as final proof of a statistical fact, however, it does indicate a trend which should be further studied. *When the loss rate among combat veterans surpasses the loss rate of new replacements, replacement of the veteran will result in an over-all saving in manpower.*

There will be some cost to any rotation program. However, this cost will be offset, to some extent, by savings in manpower which has been discussed. A review of the manpower cost of the rotation plan which will be discussed indicates that it will not result in a great increase in manpower requirements.

Elements

Accepting the fact that a rotation program is needed, the next problem is finding a practical means of placing such a program in execution. Intertheater rotation involves the transfer of personnel from an active theater to either the Zone of the Interior or to an inactive theater. Both areas present an opportunity for rotation of large numbers of combat veterans. In the Zone of the Interior, replacement training installations and certain headquarters will need the experience gained by officers and men who have participated actively in recent combat. Each combat veteran rotated to such installa-

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tions replaces a soldier who can be placed in the replacement stream.

Inactive Theater

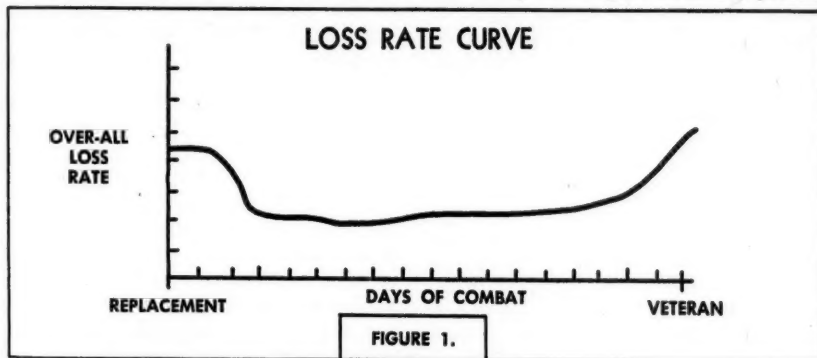
The inactive theater, where troop units must be stationed as a security measure but where no combat is in progress, offers an opportunity for the mutual exchange of personnel of the same, or similar, military occupational specialty. Little or no retraining is necessary, and the only increase in manpower requirements is caused by the time involved in the transfer. This is considered minor

bat veterans with little or no retraining, these spaces are also limited.

There are certain elements which must be present for any headquarters to institute a rotation program. The two most important of these elements are:

1. Spaces to which combat veterans can be rotated.
2. Control of replacements and replacement support.

At division and corps the first of the above elements is present to a limited degree. The second is not present. At field army and higher both are present.



when compared to the value to be gained from such transfers. After a period of time, however, the vacancies in these two areas alone—the Zone of the Interior and inactive theater—would be filled. In addition, because of the lost time involved in transfer between the active theater and the Zone of the Interior or inactive theater, rotation to these areas should only be considered in the later stages of a war. It, therefore, is necessary to consider rotation of personnel within the active theater.

The communications zone has long been considered as the area in which large numbers of spaces are available for reassignment of combat veterans. Although there are numerous spaces in the communications zone which can be filled by com-

A rotation program can be announced and implemented by Department of the Army, by theater army, or by field army. If announced by Department of the Army, it may include both intertheater and intratheater rotation. If announced by theater army or by the field army commander, it must be within the theater or within the field army.

Division Slices

In a study of the division slices, as shown in Field Manual 101-10, *Organization, Technical, and Logistical Data*, it is found that the worldwide division slice is 60,000 men. Of these, 20,000 are in the Zone of the Interior and 40,000 are in the theater. A large portion of the 20,000 spaces within the Zone of the In-

terior is taken up by replacements, both individual and unit, in training and in the pipeline. Within the theater only 10,000 of the 40,000 men in each division are within the communications zone. In other words, one-half of the worldwide division slice is located forward of the field army rear boundary. Here then, in the field army, are large numbers of spaces available for rotation of frontline combat personnel.

For each division—with an enlisted strength of 16,500—the field army commander has 13,000 troops in service and combat support units not assigned to infantry divisions. A type field army—consisting of 9 infantry divisions and 3 armored divisions when at full strength—has approximately 55,000 riflemen and weapons crewmen who are, in reality, “frontline combat soldiers.”

At the same time, each field army has approximately 80,000 enlisted spaces in regiments, divisions, corps, and units at field army level to which a rifleman or weapons crewman can be rotated with *little or no retraining*. These 80,000 spaces are found in service and combat support units in duties which are either closely related to the military occupational specialty of riflemen or weapons crewmen or for which such a soldier can be trained for the most part “on the job.” No consideration has been given to those military occupational specialties which require long, special training. In the case of artillery, ordnance, and signal units, it has been assumed that a maximum of 40 percent of the spaces can be filled by rotated infantry personnel.

Experience factors—developed as a result of combat in World War II—show that, at the conclusion of 200 regimental combat days or 1 calendar year, there will be approximately 20 percent of the original rifle and weapons strength remaining in a company. Since there are approximately 55,000 riflemen and weap-

ons crewmen in the field army, there will be 11,000 of the original personnel eligible for rotation after approximately 1 calendar year. After this initial impact is absorbed, the monthly rate of rotatees will drop and will equal about 20 percent of the number of replacements received in the field army rifle and weapons companies each month. Based on World War II experience, there will be 16,000 riflemen and weapons crewmen assigned to units within the field army as replacements during an average month. Of these, 20 percent—or 3,200—will become eligible for rotation 200 regimental combat days later. Within the 80,000 spaces available in the field army for transfer of frontline combat personnel, normal attrition will account for 3,400 losses each month.

A More Flexible Plan

The computations shown above have been based on rotation after 200 regimental combat days. A more flexible plan would permit rotation after a lesser number of regimental combat days and require rotation prior to the individual attaining a given greater number of combat days. For the purpose of this study, a span of 180 to 220 regimental combat days was adopted. During this period, an individual would be eligible for rotation but could be held by his unit commander until a maximum of 220 combat days had been attained. The average length of time—200 regimental combat days—was used in order to simplify explanation.

Tabulated, the personnel eligible for rotation under the criteria established here and the spaces available in the field army are shown in Figure 2.

It can be seen from Figure 2 that the initial large number of personnel to be rotated during the 11th and 12th calendar months will create a serious overstrength in the service and combat support units. By anticipating and planning, this prob-

lem can be reduced to reasonable dimensions.

During the 13th month, and thereafter, sufficient spaces are available within the field army for all rotatees. This does not, however, provide for the complete utilization of hospital returnees in the lower physical profiles. In actual practice there will be personnel returned to duty from hospitals who are no longer capable of performing combat duty. They must be absorbed.

All service support units in the field army, some of the combat support units in

from sources available within the theater. Rotation forward does not appear necessary, other than on a volunteer basis.

The following might well be extracted from a theater army letter of instructions directing the inauguration of a rotation program.

1. *Effective — July rotation of both officer and enlisted personnel from infantry and armored battalions will be authorized.*

2. *The criteria for selection for rotation will be:*

a. *At least 180 regimental combat days.*

PERSONNEL ELIGIBLE AND SPACES AVAILABLE

MONTH	Number of personnel eligible for rotation each calendar month	Spaces available in field army
	NUMBER	NUMBER
11th	5,500	3,400
12th	7,200	3,400
13th	3,200	3,400
14th	3,200	3,400
15th to indefinite	3,200	3,400

Figure 2.

the field army, and all the units in the communications zone should be capable of absorbing their proportion of hospital returnees.

In order to tabulate the spaces available each month for both rotatees and hospital returnees, at all levels, as well as the number of personnel falling within this category, all computations in Figure 3 have been based on one infantry division slice. They do not include vacancies within the Zone of the Interior or inactive theater.

It then appears possible to rotate primarily from front to rear, filling vacancies created by normal attrition in combat support and service support units

b. *Maximum of 220 regimental combat days.*

c. *A regimental combat day will be credited when the individual has been present for duty in his battalion, when such battalion has occupied a portion of the front or has been actively engaged with the enemy. Division commanders are authorized to designate such days for units of their division.*

3. *Upon attainment of the minimum of 180 days, the individual is eligible for rotation. He must be rotated prior to completing 220 such days. Selection of personnel within these limits will be made by company or similar unit commanders.*

4. *Each unit, regiment, division, corps,*

field army, units of the communications zone, and theater army replacement command will list those spaces within their units, which, when vacancies occur, can be filled by a combat veteran with little or no retraining. The number of such spaces will be reported by each field army and by the communications zone to this headquarters. Studies prepared at this

combat support units within their command to absorb the remaining eligible personnel within their army. Commanders will select the unit to which a combat veteran will be rotated in such a manner as to utilize fully his capabilities.

6. All vacancies occurring in service and combat support units after — July will be filled habitually by a combat veteran

VACANCIES COMPARED TO HOSPITAL RETURNEES AND ROTATEES

Vacancies in the division service and combat support elements from normal attrition	180
Vacancies in field army service and combat support units (division slice) created by normal attrition	550
Vacancies in ComZ (division slice) created by normal attrition	50
Total vacancies in theater created by normal attrition (division slice)	780
Combat veterans to be rotated each month after 13th calendar month	360
Returns to duty (division slice) under 120-day evacuation policy to be absorbed in service and combat support units	400
Total rotatees and RTDs each month	760
Surplus of vacancies over RTDs plus rotatees per month	20

Figure 3.

headquarters indicate the following spaces, as a minimum within the field army units:

Regiments	291
Divisions exclusive of infantry replacements	1,085
Corps exclusive of divisions	3,074
Army exclusive of units attached to Corps	20,045

5. This headquarters will issue a monthly quota to each field army for transfer of combat veterans to communications zone and to this headquarters. In filling these quotas only combat veterans with over 180 regimental combat days will be eligible. Field army commanders will establish monthly quotas for service and

or a hospital returnee unless long schooling in the Zone of the Interior is required for the specialty.

7. Field armies will adjust their estimates of losses to reflect the new policy. This headquarters will undertake adjustment of the replacement flow from the Zone of the Interior.

8. The records of all personnel rotated from combat will clearly indicate the individual as a combat veteran as well as the cumulative days of combat attained.

9. Nothing in these instructions will preclude normal transfer and reassignments dictated by the needs of the service except that no combat veteran will be reassigned to a frontline combat unit unless:

- a. *The individual volunteers in writing.*
b. *This headquarters authorizes such reassignment.*

10. *Combat veterans will not be told that they will not be returned to combat.*

11. *At present there is no plan to rotate other than volunteer personnel forward.*

* * * * *

The plan outlined admittedly was based on assumptions which were necessary for the completion of a study. Primarily these were the assumptions that World War II loss data was applicable, and that a 20 percent chance of survival with no serious wound or capture was reasonable. Statistically, 20 percent of the personnel who enter combat as riflemen or weapons crewmen under the above plan will never be captured, wounded sufficiently to receive *hospital* treatment, or become a nonbattle loss. Considering those members of the rifle and weapons companies

who are lost to their units from other causes and who are not disabled, the soldier assigned originally to a rifle or weapons company will have better than a 50 percent chance of survival without disability or long internment.

Conclusion

A close study of the possibility of rotation will indicate that *each field army* can institute a rotation program *on its own*. It will not be as extensive as one announced by Department of the Army or theater. There is *nothing* in regulations or doctrine to prevent the field army commander from exercising his initiative in instituting such a program. In view of this, there is no logical reason why, in the event of future war, the riflemen and weapons crewmen should not be given a reasonable assurance of honorably completing their combat service without becoming casualties. In fact, there is every reason why such assurance should be given.

The dreadful experience of rushing understrength units into action; of early emergency recalls for combat veterans with family responsibilities; of long delays in training our citizen soldiers—all these stark deficiencies hold for us a solemn warning which we must not ignore. We must realize that our Army's Regular forces must be kept close to authorized strength, that we must support those forces with a strong National Guard and strong Organized Reserve Corps made up of both units and individuals. These individuals must be trained men who, after a short refresher period of training, can effectively fill the ranks of our divisions and other units whether in combat or in training here in the United States.

General J. Lawton Collins (Ret.)

GOOD COMMANDERS CONSERVE MANPOWER

Colonel John R. Hall, Jr., *Medical Corps*
Student, Johns Hopkins University, Baltimore, Maryland

MANPOWER is the most precious commodity of the United States and of her potential allies. The Western powers, now and in the foreseeable future, are confronted with numerical inferiority in men. This must be accepted as a *fait accompli* which cannot be reversed by our tremendous industrial potential. The immediate problem confronting the military is to keep the maximum number of available manpower effective. There is much that any commander at any echelon can do to achieve this. Among the various possibilities is good *preventive medicine* and *neuropsychiatry*.

In any military organization, the commander is responsible—period. It should come as no surprise then, that the commander is responsible for the physical and mental health of his command. True, he has a surgeon as his principal staff advisor in such matters, but it is the commander who must make the decisions which implement and vitalize the program. In order to do so, he must grasp the principles and understand the rationale of the methods. The purpose of this article is to review principles and rationale.

No commander can be technically proficient in all the ramifications of combined arms and services operations. Even if such an individual could be developed, the task of remaining abreast of the developments in the numerous fields would be insurmountable. This truism is the basis, in fact, for staff organization and procedure.

The problem is actually so great that the commander is provided with a general or special staff of advisors and co-ordinators in broad fields of interest, as well as technical and administrative advisors in the more specialized fields.

Let us examine our organization with a special eye toward the maintenance of physical and mental health. First, consider the advisors in the broad fields. Their fields of interest are best pointed up in Field Manual 101-5, *Staff Organization and Procedure*. The personnel officer is, quite naturally, concerned with any matters affecting individuals. Personal hygiene comes under his supervision in discharging his duties pertaining to personnel services.

The operations and training officer becomes involved in the training of all individuals and units in hygiene, personal health, and sanitation, as well as general supervision of training of specialized units for preventive medical activities. Further, in planning operations he may well be able to plan for the avoidance of unhealthful localities. The logistics officer has primary responsibility for sanitation as a service, as well as the provision of adequate matériels to effect prevention programs. It is also obvious that the intelligence officer, in his production of intelligence, must include matters pertaining to the health aspects of objective areas.

The military government officer also has an important role, for armies operate in civil communities and are susceptible to cross infection from civilian populations. Thus, the commander relies heavily upon his military government officer to effect civilian health practices which will reduce hazards to troops. Obviously, the chief of staff has an across-the-board interest in all these matters.

Several special staff officers have important roles in preventive medicine. Chief among them in this particular field is the surgeon. He must plan and supervise the execution of the preventive medicine program within the command and occupied territory. The dental surgeon advises the commander and staff on matters pertaining to dental service, and is specifically charged with advising the surgeon in all matters that may have a bearing on the health of the command from a dental standpoint. The engineer must provide safe drinking water, fixed bathing installations, insect and rodent control in fixed installations, and other sanitary installations, among his other duties. The quartermaster is responsible for aspects of the food service program; operates bakeries, laundries, dry cleaning plants, mobile fumigation and bath installations, refrigeration installations, and other adjuncts to a health program. He must provide supplies for sanitation.

It is obvious then that an adequate

that considerations go to the very roots of command and staff responsibility.

Potential Savings

Let us consider for a moment the magnitude of manpower savings to be achieved. Had the United States experienced the death rates of the Civil War during World War II, we would have lost 2,175,000 dead from disease alone, rather than the approximately 16,000 actually experienced—excluding disease among prisoners of war. This amounts to 36 divisions on the worldwide-slice basis. Since this represents considerably more force than General MacArthur employed from Australia to Manila—to include the communications zone and Zone of the Interior buildup therefor—it is apparent that the potential savings are great. The major difference between the disease death rates of those two wars lies only in better preventive medicine. And no military establishment has any reason for complacency, for history reveals that man-day losses from disease have far outweighed those from battle causes in any war ever fought.

Reflect upon malaria in World War II. This one disease, which was readily suppressed by the daily administration of an atabrine tablet, and largely prevented by clothing discipline and sanitation, cost the United States 18 division-months.

Figure 1 indicates that there is still plenty of room for improvement by the

The immediate problem confronting our military establishment is to keep the maximum number of available manpower effective. There are steps that any commander at any echelon can take to help solve this problem

preventive medicine program is dependent, to a considerable extent, upon all of the general and many of the special staffs. It is not a unilateral medical problem, as many appear to believe. When one considers the many facets of preventive neuropsychiatry in particular, it is obvious

United States Army in the prevention of disease. In fact, it would appear that we did little better in this respect in Korea than we did in World War II, although the figures are open to some debate because of the localized nature of the conflict. It is sufficient to say, however,

that great potential manpower savings are available to the commander who provides adequately for preventive medicine. In a squad, this may mean a rifleman; in a company, a squad; in a battalion, a platoon; and in a regiment, a company. To the division commander, this amounts to about a battalion—and *what division commander does not want another battalion?*

Spread of Disease

Communicable diseases are those which can be spread from man to man or from animal to man. Figure 2—taken from Field Manual 21-10, *Military Sanitation*—represents the three links in the chain of spread of communicable diseases. There must always be a source, a means of transmission, and susceptible individuals. Any rational control measure must be directed at one or more of the three links of the chain.

The source of disease may be a diseased person or one who does not have manifestations of the disease but who carries the disease organism. The source may also be an animal.

There are several means of transmission—but they may be grouped as contact, either direct or close—water, food, and bloodsucking insects. For every disease known, there is either direct or *prima-facie* evidence of a means of transmission.

A susceptible individual is anyone who

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will develop a disease if infected. For large outbreaks of disease there must be large numbers of susceptible individuals, as well as a source and a means of transmission.

Disease can be thought of in many terms. Likened the initial infection to an *attack*, the onset of symptoms to a *penetration* with damage to the defender, and recovery to a successful *counterattack* with restoration of the position. Viewed in these terms, we have some interesting parallels.

The counterattack force is not a ready reserve. It must be called up by a total mobilization of the body resources. A very interesting fact is that once mobilized, many of these defenders for specific diseases do not take their 85 points and go home for demobilization. Rather, they remain as a more or less permanent ready reserve to repel future attacks. In medical terms, this is known as *active immunity*. That is, it is developed by and within the body of the individual by active production of his mobilization base. These mobilized defenders are in the fluid portion of the blood.

This is fortunate, because for some diseases we can take this material from an immune individual and give it to a susceptible who has been exposed to a disease. This affords transient protection and is known as *passive immunity*. Even more fortunately, the donor animal does not even have to be of the same species. Thus, as an example, man can be protected from tetanus by serum from an immune horse. This used to be of considerably more import, but now we have an immunizing agent which can produce *active immunity* to tetanus in man. This same phenomenon was the basis for the hope of protecting children from poliomyelitis with gamma globulin.

This brings up an interesting occurrence upon which the medical man capitalizes. This mobilization can be caused

by deception. If very weak or even dead attackers are introduced into the body of the susceptible, *active* immunity can be induced. In fact, in some cases just the waste products of the attacker will trigger the reaction. This is the basis for immunization. There is even more to this rosy picture. Once the body has been forced to mobilize defenders against a disease, it keeps its defense plants on a standby basis. Thus, a fresh attack or deception calls forth a sudden, and usually

may favor direct assault or penetration of the position. This is transmission by direct contact. He may favor an airborne capability, with some highly specialized features such as invisibility and built-in gliders and parachutes. This is transmission by respiratory means—close contact. Others have an even more modern concept and ride to work in movable wing airframes—these are insect-borne diseases. Still others have a highly developed amphibious capability and are invisi-

THE DISEASE INCIDENCE RATES OF THE ARMY
IN WORLD WAR I, WORLD WAR II, AND KOREA (JULY 1950–MAY 1953)
RATES PER 1,000 TROOPS PER YEAR

	WORLD WAR I APRIL 1917–DECEMBER 1918	WORLD WAR II JANUARY 1942–DECEMBER 1945	KOREA JULY 1950–MAY 1953
DISEASE RATE	947	649	648
COMMON RESPIRATORY DISEASES	563	167	91.5
VENERAL DISEASES	95	43	155
MUMPS	62	4.3	0.97
MEASLES	31	3.1	0.95
DIARRHEAL DISEASES	27	21	35.03
PNEUMONIA	21	11	9.54
TUBERCULOSIS ALL FORMS	10	1.1	0.81
MALARIA	4.2	19	9.26
SCARLET FEVER	3.3	1.2	0.04
MEINGITIS	1.3	0.6	0.11

FIGURE 1.

overwhelming, production by the defense machine. This is the basis for the periodic stimulating dose in immunization.

To get back to the attack, it is made by vicious enemies. During the attack some spoil off and attempt to overrun adjacent positions. Once the original attacked position—or individual—is overcome or occupied, we have a source of attackers for other adjacent positions. Keep in mind that the more adjacent, the better. This has a bearing upon the elimination of overcrowding as a means of prevention.

The attacker has many methods. He

ble while riding to the objective area on vessels upon or beneath the surface of the water. These are the food and water-borne diseases.

Here we have disease in military terms. We have a diseased or carrier man or animal as the source of a potential overwhelming mass of attackers. The attackers can use the direct contact penetration, the close contact aerial envelopment of the respiratory system, longer-range movable-wing aircraft envelopment through bloodsucking insects, or amphibious assault through food and water, as means of transmission. And there must be un-

defended or relatively weakly defended—susceptible—individuals to be attacked. To produce effect, the attacker relies heavily upon the principle of mass, but also takes cognizance of the other principles, particularly the offensive, simplicity, and surprise. As indicated above, the attacker is not unmindful of maneuver and the objective.

Defense Rationale

Defense against disease—since we know so much about it—can then follow rational patterns and carefully developed prior planning. Wherever possible, countermeasures must be taken against the source, the means of transmission, and the susceptibles.

The source can be isolated by quarantine or by hospitalization. In many cases, just staying far enough away is sufficient—for example, locating troop bivouacs or other concentrations away from habitations of sources or potential sources. When an animal is the source, it can either be destroyed, isolated, or driven away.

The means of transmission can be negated by many devices. They should be aimed at specific objectives. Direct contact can be avoided. Good food service and food discipline programs cut down diseases transmitted on food. Water purification and water discipline control diseases transmitted in that media. Avoidance of overcrowding, the use of cubicles, and adequate ventilation of barracks and enclosed meeting places help control the respiratory diseases. Insect control measures, to include screening, netting, and clothing discipline, as well as direct and indirect extermination of insects, are other methods employed against the means of transmission.

Susceptibles may be rendered nonsusceptible through immunization—either active or passive. Active immunity is preferred as it is of longer duration and of

greater economy. Susceptibles may be kept from sources by nets, screening, repellents, smudging, and other means of indirect control. Strict food and water discipline also protect susceptibles. In some cases, suppressive therapy may be used to prevent the susceptible from becoming clinically ill, even though he may become infected. In this case, the attacker penetrates but is prevented from developing overwhelming mass by the administered drug.

Defense against, or control of, disease is simply a matter of commonsense application of principles. Further examination of Field Manual 21-10, *Field Sanitation*, will reveal that it treats each disease in terms of source, means of transmission, and susceptibles. Once the actual or potential presence of a disease is known, through experience or intelligence, a commander can use this manual to assist in making an estimate of the situation and decide upon the adoption of courses of action which can reasonably be expected to bear upon the source, means of transmission, or the susceptible. In most cases, it will be a combination of courses directed at more than one of those links in the chain of spread of disease. This is not to say that the manual is designed to replace the technical advice of the staff medical officer. However, it does point the way toward rational means of disease control and is of value to the commander and staff as a ready, practical reference.

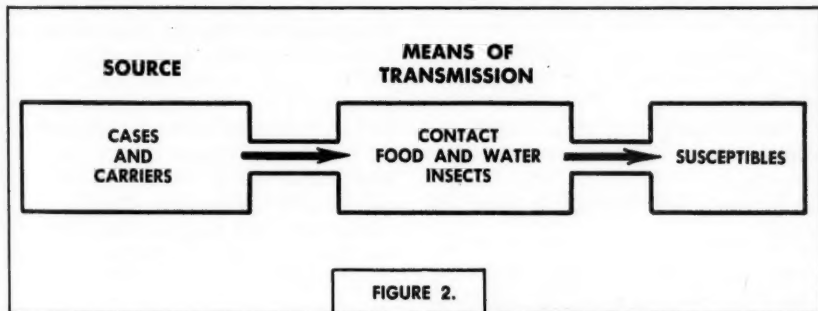
Practical Employment

The practical employment of the manual can best be demonstrated by historical example. In December 1944, the 1st Cavalry Division prepared to move to Oro Bay, New Guinea. The advance party found that the bivouac areas at Dhubadura—several kunai grass meadows—were immediately adjacent to a company which had suffered several cases of scrub typhus.

This disease is known as *Tsutsugamuchi* or Japanese River Fever. Paragraph 153, page 15, Field Manual 21-10 (July 1945) indicates that this is a disease of rodents transmitted by mites. The simple solution appeared to be to mow the meadows, allow the grass to dry in the tropical sun, then burn it off. This was done. The mites which transmit the disease were thus destroyed and the rodents in the area were either destroyed or driven off. By simple vegetation and rodent control in the area, the troops remained protected. In the entire division there was only one non-fatal case of the disease during the 3 to 40 months it remained in the area.

in the chain and pointed the way to disease prevention through rodent and flea control. This was done. The division lost no personnel because of this disease. The basic facts were well publicized to the individuals of the command. They were so enthusiastically received that troop dogs were absent from the camp. This occurred because all understood that dogs would catch and bring the rodents into camp, thus exposing the command to infected fleas.

These examples have been selected to indicate the fact that simple, common-sense measures, as indicated in the manual, can save many potential losses. The



Hundreds of disease losses were thus obviated by directing control measures against the source and means of transmission. The susceptibles could not be immunized because there was no suitable immunizing agent, but repellent probably assisted in avoidance of any mites remaining in the area.

In 1947, the 2d Infantry Division was scheduled for maneuvers near Yakima, Washington. The area was reported by the United States Public Health Service to be inhabited by mice harboring Bubonic Plague. Further, the mice were infested with fleas which could transmit the disease. Paragraph 21, page 20, and paragraphs 149 and 150, page 155, of the manual indicate that the reported information was correct with regard to links

information is available from the surgeon and the manual. Simple precautions pay huge dividends.

It must be remembered that the defender mobilizes his local defenses, constitutes a counterattack force, and gets ready for local ground action to repel the attacker. Simultaneously, he conducts strategic warfare against the enemy to reduce his force and his industrial production to support the force. At the same time, he conducts counterair and interdiction operations to isolate the battlefield and reduce reinforcement and logistical support capabilities of the attacker. This is exactly the situation in the fight against disease. We must be ever vigilant and must always bring the full weight of our effort to bear against the source of infec-

tion, the means of transmission, and in protection of susceptibles.

Just as we must understand the underlying mechanisms of disease transmission to intelligently control it, so must we approach preventive neuropsychiatry. Commanders in combat soon become aware that there are numerous nonbattle losses which are not caused by outright organic illness. In fact, their frequency exceeds the battle casualty rate in increasing proportions according to the size of the unit in combat. These represent about 50 percent of the nonbattle losses and are manifested as:

1. Persons with slight organic disease that is only mildly, if at all, incapacitating.
2. Individuals with subjective complaints but with negative or inconsequential physical findings.
3. Self-inflicted wounds or other injuries at least brought about by carelessness.
4. Persons with broken dentures or glasses.
5. Psychiatric cases.

They may return to duty, but their losses affect the unit and their conditions frequently remain unchanged after return. Then we have the disciplinary offenders, especially those involving purely military offenses. Last, but far from least, are the combat ineffectives—S. L. A. Marshall's "nonfirers."

An inability to assume or continue aggressiveness toward the enemy is common to all these individuals. This inability stems from a force within the individual—it is normal fear. Almost all individuals have battle fear. This is provoked by sounds and other stimuli to the individual. Fear is a basic biological func-

tion and in battle varies with real or imagined danger from the enemy.

The antidote to fear is co-ordinated external activity. The Rebel yell, firing of weapons, and activity of movement restore logical thinking and rational decision.

Group identification, or group unity, is a powerful sustaining force to the soldier which involves an emotional bond which develops among those individuals who experience common hardships and dangers.

This has been a brief and simple discussion of fear and its results. It emphasizes that fear is normal and results indirectly in a multitude of losses to units. It indicates that the old Army techniques devoted to activity under all conditions, plus an esprit de corps among soldiers of a command, are of great importance. Our military forefathers are vindicated for "spit and polish," pride of unit, and other taboo items which have been adversely commented upon recently. This brief discussion may open avenues upon which you may develop ways of avoiding neuropsychiatric losses.

Summary

This article has attempted to reduce a complex technical subject into terminology and courses of action familiar to commanders and staff officers. It emphasizes that we must know the mechanisms of physical and mental disease if we are to prevent multitudinous losses by simple countermeasures directed at the source, the means of transmission, and protection of the susceptible. Reference has been made to Field Manual 21-10, *Military Sanitation*, which should be well known to commanders at all echelons.

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

Command and General Staff School Of the Philippine Armed Forces

Lieutenant Colonel William E. Shedd, *Armor*, and
Lieutenant Colonel Lee E. James, *Infantry*

THE task of constantly increasing the professional knowledge and over-all proficiency of the Regular Officers Corps is a challenge to the military establishment of every country. The establishment of the Command and General Staff School on 1 September 1953, by the Armed Forces of the Philippines, was a major step in answering that challenge.

For many years senior officers from the Philippines have attended the Command and General Staff College of the United States Army. In many respects the new Philippine Staff School is modeled after the United States College. In an opening address the Commandant said:

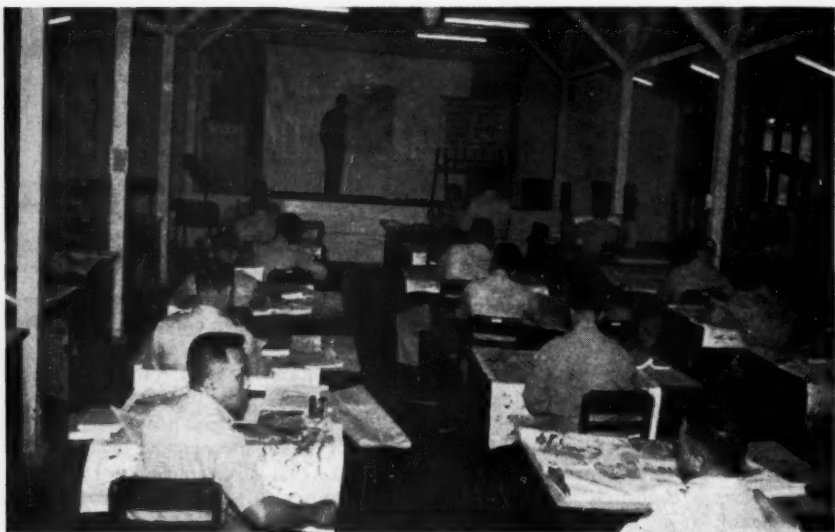
The organization, procedure, and techniques of instruction employed in this school are closely patterned after those of the Command and General Staff College at Fort Leavenworth, Kansas. We, the school staff, subscribe to the statement of a clever German Chancellor who once said: "Fools learn by experience. I prefer to learn by the experience of others." While the school does not profess to be as clever as the author of the aforementioned statement, we feel that it is wise to pattern our organization after an institution whose products have stood well under the trials of battle.

The program of instruction at the new school is a modified version of the Regular Course presented at Fort Leavenworth. Because the course is limited to

35 weeks, some of the subjects have been reduced in scope or eliminated, and since the Philippine Army does not have an advanced course for the various arms or branches in its military school system, the program was modified to include review of battalion and regimental level subjects. The lack of an advanced course is recognized, however, and steps are being taken to institute such a course.

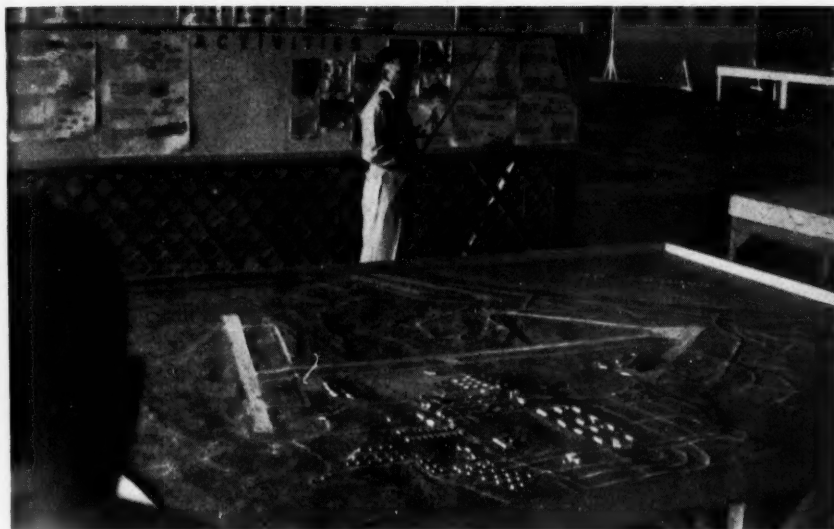
Candidates for the new school are carefully screened and the officers selected are those mature, deserving, field-grade officers who are considered to have the highest potential for additional future responsibilities. Successful completion of the course will be a dominant consideration in the promotion of senior officers, and failure to complete the course will constitute grounds for immediate separation. While this appears severe, it indicates determination on the part of the Army to improve the Officers Corps. This view was clearly stated recently when the former Chief of Staff of the Armed Forces of the Philippines stated:

Your selection to attend this school is evidence of the Armed Forces faith in your potential to assume greater responsibility in case of war. Bear in mind that an enlisted man's or junior officer's respect for his superiors is based on a full appreciation of the intelligence and ability of his leaders, and, therefore, the leaders we offer must have unassailable talents.



Because the education system of the Philippine Army does not offer an advanced officers' course, the program of instruction at the new school has been changed to include a review of battalion and regimental level subjects. Above, a class attending a classroom exercise. Below, the class going over the ground involved in the map exercise.





Steps are being taken to institute an advanced course in the present school located at Fort William McKinley, Rizal, Philippine Islands. Above, visual aid instruction being given on Air Force facilities. Below, members of the first class of the Command and General Staff School taking part in a roundtable discussion of a school solution.





The organization, procedure, and techniques of instruction employed in the Philippine Staff School are patterned after those of the Command and General Staff College at Fort Leavenworth, Kansas. Above, a shipment of maps being received which have been airlifted from the United States. Below, students being oriented for a map problem.





The initial class of the school was composed of 34 selected, mature students. The successful completion of the course will be a dominant factor in the future promotion of field-grade officers. Above, student officers solving a requirement in the field. Below, members of the First Regular Course attending their graduation exercises.



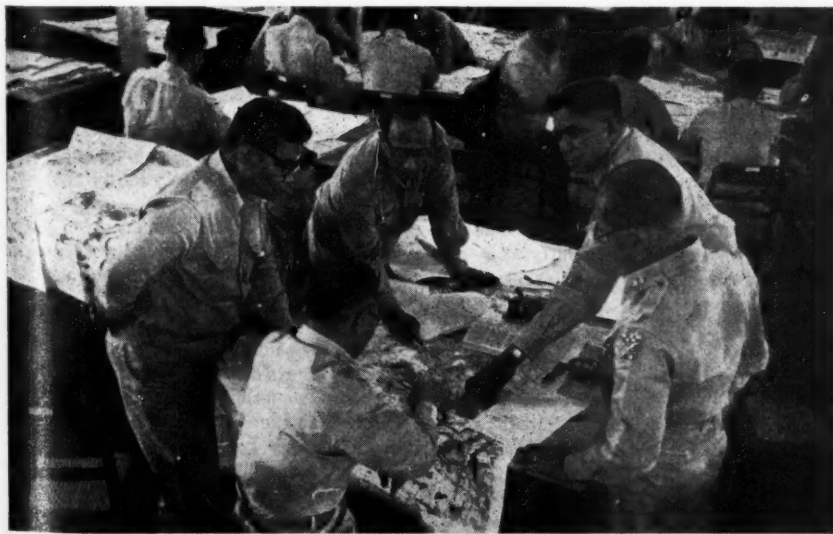


The program of instruction at the new school is a modified version of the Regular Course presented at Fort Leavenworth, home of the Command and General Staff College of the United States Army. Above, helicopters being used to augment ground reconnaissance. Below, student officers climbing a steep trail during a terrain exercise.





Because the course at the Philippine Staff School is limited to 35 weeks, some of the subjects being taught have been reduced in scope from those given at Fort Leavenworth. Above, instructor and student observing terrain from a division vantage point. Below, officers debating a point in question during staff work on a problem.



The Changing Nature of War

Colonel Frank J. Sackton, *Infantry*

Office of the Assistant Chief of Staff, G3, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN THE current rapid flight of history—with significant happenings telescoping one onto another—it is interesting to note that our newborn atomic age is the underlying factor controlling most of the significant actions of our time. The impact of atomic energy on the art of war appears, at first glance, to be overwhelming. However, precisely in what directions and to what extent does it change the nature of war? It becomes compelling that officers of the Armed Forces give greater thought to conditions created by the introduction of the new weapons into the military arsenal. Do these weapons change the concept of war itself? In what way do they change strategic thinking? What impact do they make on tactical situations?

From the beginning of time there has been conflict of interests among the peoples of the world. Frequently this conflict was resolved by negotiation; sometimes it was resolved by armed conflict. The point where negotiation or diplomacy failed as an instrument of national policy and resort was made to war is indeed difficult to define. Moreover, there may not be a definable point at this juncture for, as Clausewitz stated: "War is nothing but a continuation of political intercourse with an admixture of other means." He held that conflict among nations al-

most always conformed to a single pattern; first negotiation, and then war when negotiation failed. Thus, it appears that negotiation or diplomacy and war are the means by which conflicting interests among peoples of the world have been resolved. Whether nations resort to one or the other—or both—for a solution to their differences is a matter of choice of the nations themselves, or the choice of one nation that can and desires to force such an alternative upon the other.

The Record

The resort to the violence of war for the settlement of international disputes may seem, at first glance, an unusual court of last resort—a last ditch approach to the problem. Actually, war has been at least as frequent as peace throughout the 5,000 years of recorded history. Moreover, succeeding wars increase in destructiveness while at the same time they appear to occur more frequently. Since the turn of the century, there have been a total of 27 major wars including the most destructive wars of all time—World Wars I and II. During this period of 53 years, one or more major wars have been in progress continuously except for a period of only 6 years.

Why do nations resort to the violence of armed conflict to settle their differences? They do this to get a clear-cut decision—something that is not always possible at the conference table in a battle of words. Particularly when one nation is weak militarily, a strong military power can impose a condition of war by attacking it and thus forcing a solution

favorable to its cause. Similarly, a group of nations—individually weak—may ally themselves to form a strong military bloc to gain greater weight for their arguments in negotiation, or to ensure victory in war if negotiation fails. The violence of war has been used effectively to throw off the yoke of political tyranny when all other means failed. War was used as the instrument to gain political freedom and independence for the United States. Sometimes a nation will go to war because it is the lesser of two evils—war may be an acceptable alternative to submission. Nations devotedly seeking peaceful solutions to international disputes may be forced to war rather than accept the maintenance of peace on the aggressor's terms.

Then too, there have been religious wars. The Crusades to the Holy Land, and the spread of Mohammedanism by force of arms are only two of many examples. Wars have been fought for ideologies, for economic or political gain, for expansion of boundaries, and out of fear for security.

Alexander the Great, Julius Caesar, and Genghis Khan, to mention only a few, fought for glory and personal power.

The Cold War

In recent years the term "cold war" has become popular. It refers to a condition of international tension somewhere between negotiation and war itself. It is

Victory, in the future, will come to the side which can best grasp the significance of the changing nature of war, and plan for attainment of maximum benefits from the diplomatic, strategic, and tactical arts

actually that point where political intercourse between nations has become strained, and the next step in a worsening situation could lead to armed conflict. In the cold war the participant nations are, in fact, in political and economic conflict, but by the exercise of mutual restraint

full-scale warfare has not developed. The entire Continent of Europe has been under attack since the end of World War II in 1945. The prize is the coal and steel of the Ruhr and the Saar, a highly industrialized continent, and a population of 300 million people which includes one of the most skilled labor forces of the world. Whichever of the two power blocs that controls this vast asset has, in fact, the balance of power in the world today.

There have been no bullets or marching armies, but the ever-present shadow of military force has been used as a wedge to gain political ends. The technique of terror and psychological warfare—with unlimited use of vituperation in press and radio propaganda—has run a full course. Subversion, sabotage, espionage, political trickery, and chicanery have been employed on a large scale. There has been the economic squeeze to keep food from people—such as the Berlin blockade. However, the cold war approached a warmer degree in Greece where an outside power incited and armed Greek groups to revolt against the lawful government. International politics have been fraught with divisive tactics against the nations of the opposing bloc—while practicing cohesion tactics for the friendly bloc. The war on the economic front is extensive and bitter because the fight for world markets employs methods which only a few years ago were considered underhanded and unethical by most of the world powers.

To date, this complexity of conflicts in the world has been contained at the level of international politics and negotiation. But how close are such volatile actions to a shooting war? Remember, it was only a short generation ago that many of the disturbing actions of today

such as blockade, shooting down airplanes of another country, open subversion and sabotage, summary recall of ambassadors, breaking off diplomatic relations, and the arming of guerrillas were sufficient cause for declaration of war against the offending nation. A critical danger of the cold war is the fact that it deteriorates international relations to such an extent that the situation can be likened to a tinderbox. A small spark can set off the volatile mass compelling the nations to resort to armed conflict, as occurred in Korea. Thus we see that the thread between the cold war and a hot war is thin indeed.

The Hot War

Once the policymakers have decided to employ armed forces to settle an international dispute, the purpose of the military is to win on the battlefield and thus restore the peace. It is not generally appreciated—in this country—that the purpose of our military services is, and always has been, to restore peace after the peace is broken in the channels of diplomacy. The military services of our country have nothing to do with war except to win it when the policymakers decide—or are compelled by outside forces—to resort to war as an instrument of national policy.

The military man has no control over

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whether diplomacy or war is employed to resolve international differences—the Chief Executive and the Legislative Branch of the Government make this decision. It is compelling, however, that the military man be cognizant, at all times, of the factors which may lead to war. Frequently, international disputes slip from the conference table to the battlefield with the suddenness of lightning. In times of peace, the military man must study the art of war and the manner in which modern technology can be applied to achieve victory on the battlefield. He must be prepared to perform his role with maximum efficiency and skill at precisely the moment when his country has decided to employ war as an instrument of policy. It has been possible in the past to develop the sinews of a military machine after war was declared. The tools of war were manufactured, the required leadership, skills, and manpower were trained after hostilities had started. This is no longer possible. Small holding forces do not have the capability to hold off a modern aggressive enemy while a country arms. Topographical obstacles and the oceans of the world no longer provide barriers which permit organization for defense. The world has become so small that all the peoples of the world are next door neighbors.

Intercontinental War

Up to the present time, shooting wars have been confined to the boundaries of a single continent. Nations outside the affected continent could bring their power to bear only through the long haul across the oceans. This was time-consuming and costly as the vast pipeline had to be filled with materials and human resources before it could have effective impact at the scene of conflict. It was evident in World Wars I and II that this linkage required a tremendous transportation effort and an enormous covering force. Even with the impressive speeds and flexibility inherent

in the employment of aircraft in World War II, it was a long haul of several years before decisive military strength could be applied on the enemy's homeland across the Pacific.

Today, we find the world has shrunk—when measured in terms of time rather than distance. War no longer tends to continental conflict. Military power can be applied intercontinentally with the ease which once it was applied continentally. Oceans no longer provide barriers to an attacking force and, conversely, oceans provide no security for a defending force.

The time and distance chart on page 57 shows how really small our world has become. It grows smaller each day as aircraft speeds are improved, and as intercontinental guided missiles become a reality.

Military Strategy

Once a nation extends its international argument into the field of armed conflict, the military element gains ascendancy and all resources of manpower and the economy are placed at the disposal of the military machine to ensure victory. What is victory? In the past this has meant the destruction of the enemy to the extent that he could no longer wage war; thus, he was forced to surrender outright or to seek an armistice to the fighting until surrender arrangements could be effected. The key in this concept of victory is destruction.

Prior to 1914, wars were fought with small armies and navies, and loss of life and destruction of matériel was limited to the scene of battle. When one military force was bested in battle by the other, the vanquished was thus destroyed for all practical purposes. The over-all cost of waging war was represented by a small part of a nation's resources in men and materials.

World Wars I and II changed this pattern radically with the advent of the concept that all material goods and man-

ufacturing resources must be placed at the disposal of the armed forces. The introduction of the airplane for attack on urban communities and manufacturing centers placed the civilian population in the midst of battle. The entire world became the battlefield. The increase in fire power, the multiplicity of weapons and weapons systems, and attack from the air conspired with a breakdown in international legal limitations upon the methods of waging warfare. Thus, the phrase "total war" came into being, and with it a state of chaos and ruin in all countries within range of the enemy's aircraft.

In World War II, the destruction of the enemy's forces in the field did not in itself spell victory.

The sinews of power in the enemy's homeland also had to be destroyed before victory was achieved. In spite of the employment of tens of thousands of tons of high explosives against the heartlands of Germany and Japan, their destruction in the military sense could not be effected until these countries were physically occupied by troops. Then, the manufacturing sites were dismantled and the hostile armed forces were disbanded.

Destruction or Annihilation?

It is in this area of military strategy that weapons of mass destruction make their greatest impact. Harry S. Truman—former President of the United States—in his last State of the Union message on 7 January 1953 spoke of these new weapons in an ominous tone:

The war of the future would be one in which man could extinguish millions of lives at one blow, demolish the great cities of the world, wipe out the cultural achievements of the past—and destroy the very structure of a civilization that has been slowly and painfully built up through hundreds of generations.

Is there a need to occupy a defeated

country which has been so effectively destroyed that populated areas have been leveled? Such areas become "no-man" lands on a vast scale within the enemy's borders. Human casualties are numbered in the millions, and the survivors are without shelter, food, or medical facilities as the urban centers and food distribution facilities are wiped out. Nor is it likely that the great cities can be spared in an all-out attack because the critical targets of war, the industrial concentrations, railroad marshaling yards, and major airports are all in or near large cities. The super weapons cannot attack these targets without wiping out entire communities.

Thus, the new weapons give us a new connotation to the word "destruction." Unlike the traditional military meaning of the term, we now have in fact "annihilation." The annihilation of a people, their cities, mode of living, and the very pattern of their existence, which reduces the surviving population to primitive existence, introduces new concepts to the objective of "victory."

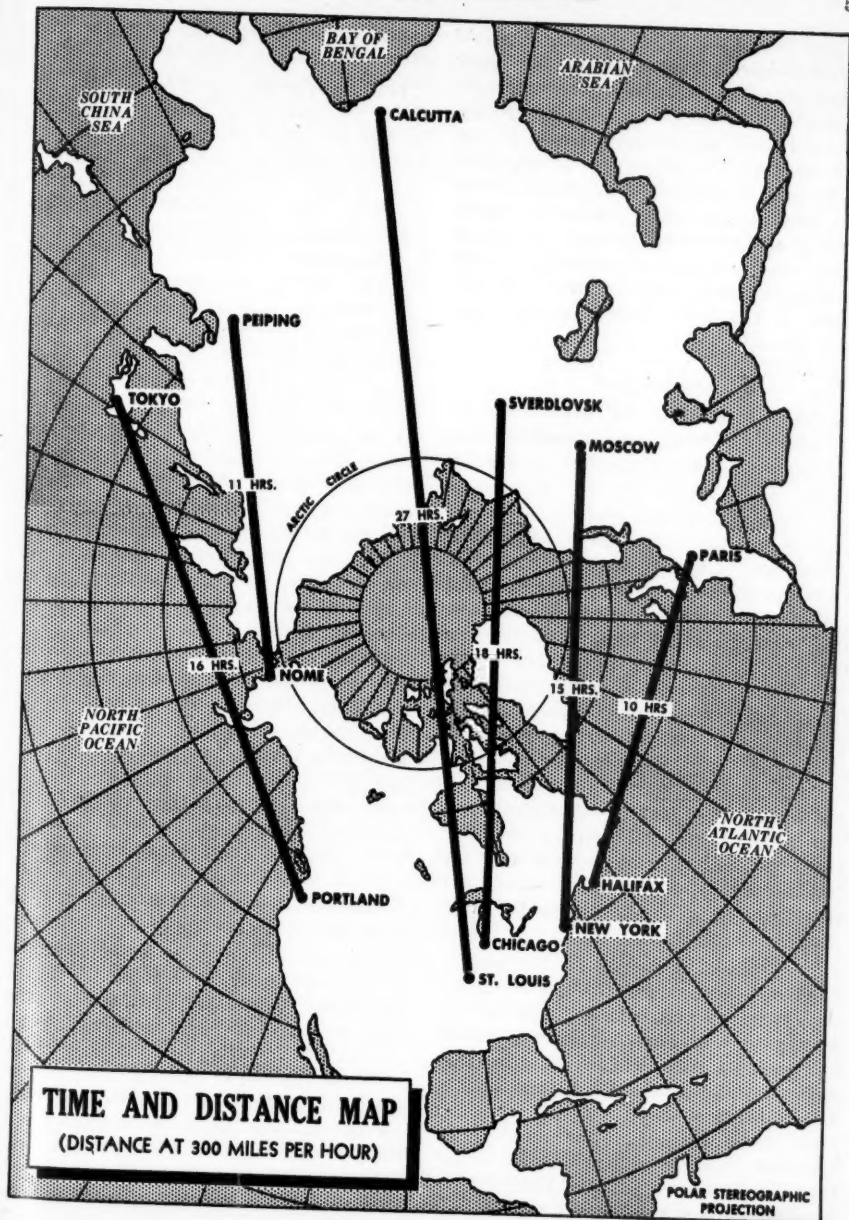
What can one nation gain by such a victory over another? Certainly the traditional pattern of reparations and cession of territory is no longer applicable when everything of intrinsic value is destroyed. It seems that such a war would be a war of hate—not a war designed to destroy a nation's government and to seek material or political advantage. How paradoxical, how untraditional such a war would be. The armed forces of the nation being attacked would receive only incidental blows, while the homeland would be the main target for the quick knockout punch that would reduce the attacked country to ruin and defeat.

This could be the pattern of strategic war if an irrational government had exclusive use of weapons of mass destruction. However, it is clear that several great powers of the world possess—or

will have in the near future—this capability to destroy the other. As President Eisenhower said before the United Nations General Assembly on 8 December 1953: "But the dread secret, and the fearful engines of atomic might, are not ours alone." It seems reasonable that one nation having these weapons will not unleash such strategic blows against another unless it is assured that it will be free from effective retaliation. Nations possessing these weapons will, as a matter of primary consideration for their own survival, maintain secret and dispersed launching sites in a status of readiness for an effective retaliatory capability. Thus, the employment of these weapons by one nation against the homeland of another will bring upon its own head certain destruction. It would appear unappealing for a rational government to seek such a solution to its international disputes. Dr. Bernard Brodie summarized this point very well in his article in the January 1954 issue of *Foreign Affairs* magazine when he wrote:

Strategic bombing, which used to be deprecated on grounds of its presumed ineffectiveness, may in the future have to be restrained because it has become all too efficient. The ability to destroy the enemy's economy and some 30 or 40 million of his people overnight might be inharmonious with our political objectives in war even if it could be done with impunity; but if we have to suffer such a blow, the fact that we can also deliver one may be of small advantage and smaller solace.

Is it possible that a nation will find a method to neutralize or stop an enemy's attack while it delivers such a blow with impunity? Such a possibility remains quite remote for the present. In his United Nations address, President Eisenhower touched on this point when he said:



But let no one think that the expenditure of vast sums for weapons and systems of defense can guarantee absolute safety for the cities and citizens of any nation. The awful arithmetic of the atomic bomb does not permit of any such easy solution. Even against the most powerful defense, an aggressor in possession of the effective minimum number of atomic bombs for a surprise attack could probably place a sufficient number of his bombs on the chosen targets to cause hideous damage.

Limited War

This is not to say that a stalemate in the strategic use of nuclear and thermonuclear weapons will outlaw war as a means to settle conflicting differences among the nations of the world. Although such a solution would be a happy one indeed, we must be realistic. There is always the specter of "limited" or "peripheral" war confronting the world. The Korean action brought into focus the fact that the strategic employment of weapons of mass destruction was not resorted to, although the opposing blocs possessed this capability throughout the 3 years of conflict. Clearly, the opposing blocs desired to limit the fight to the battlefield—the land mass of Korea. The Korean conflict provides the military thinker with a vast breadth of material for analysis, for here was a conflict in the atomic age that was fought in the classical concept of conventional war.

Here was a fight with all the modern trappings—except for the use of weapons of mass destruction. Here was a fight that was waged on a well-defined battlefield—Korea—while no attacks were directed against the homelands or the main logistical bases of the opposing blocs. Here was a fight that was carried out with balanced military forces in the traditional sense. Such a reversion to conventional war surely must have a great

appeal to large segments of the peoples of the world.

Let us consider the possible developments of warfare on the battlefield in the age of atomic plenty. Tactical atomic weapons could be introduced in limited wars without resorting to their use strategically. The factor that precludes the use of weapons of mass destruction against the homelands of nations—the threat of annihilation for both sides regardless of who initiates such attack—need not preclude the use of atomic tactical weapons against targets in the battle area.

Any attempt on our part to match the Soviet and Chinese military manpower masses would be catastrophic in the long pull because it would spell our economic ruin. Nor should the need to secure decisions on the battlefield necessarily imply the need for large masses of men. Implicit in the current reappraisal of our own Army forces is the thought that enemy hordes may have to be fought—either in Europe or in Asia—and they must be defeated with smaller but more effective forces. We are thus impelled to search for new methods that will keep us ahead of the enemy in the tactical art. Additional reliance is indicated on our scientific and operational research, but more important, we need improved and expanded tactical atomic weapons systems. A modern army, highly mobile, fast-striking, hard-hitting, and equipped with a complete line of atomic ordnance will meet the requirement.

Much has already been accomplished in the development of weapons for use on the battlefield. Tactical aircraft, guided missiles, free rockets, and artillery are all capable of delivering nuclear destructive power in support of tactical forces. However, we need to go much further than we have to date. We must develop atomic arms for all echelons of our forces which fight on the battlefield. It would be well to outline the pattern of ground warfare

under this concept. Taking Europe as an example, we find there great numbers of enemy ground forces in being. We must balance out these manpower masses with our atomic weapons. This can be done only if we induce the enemy to concentrate and thus provide atomic targets. Let us take, for example, one segment of our tactical ground forces to examine what can be accomplished in this respect.

Battlefield Mobility

The battle for dominance of armored forces has been, heretofore, a race for bigger and bigger tanks with heavier and heavier armor plate. However, these land cruisers can be self-defeating if they become so big, so unwieldy, and so heavy that they cannot successfully and speedily traverse the ordinary roads and bridges, or negotiate the more difficult terrain. On the other hand, lighter and faster hard-hitting armored forces can elude the enemy's atomic weapons by dispersion and evasive tactics, and yet, they can concentrate swiftly to strike at the vital enemy targets. The enemy can react to such thrusts only by concentrating his forces for counteraction—such concentrations as provide choice atomic targets for our tactical air and ground-to-ground guided missiles. But this should be only part of the pattern. The tank itself should have the capability of firing atomic projectiles so that it may more readily destroy the critical targets and the enemy it has induced to concentrate. This is not to say that the tank should fire nuclear ammunition producing the great yields of today's atomic weapons. Tank cannon projectiles would necessarily be of a much lower order of magnitude—yet retaining the destructive features of atomic detonations. The tank should be atomic-designed in other respects. Shielding from radioactivity is required so that personnel will be protected when the tank traverses contaminated areas—particularly when

the force rapidly exploits its own or the enemy's atomic bursts. Such tanks must be designed to accommodate rapid decontamination equipment which could well be simple water-hose connections to provide water spray under pressure to all exterior parts of the tank. Armored forces withdrawn from combat would be staged through decontamination centers for this treatment.

In the area of tactics, battlefield mobility must replace the slow and deliberate approach to battle. The sharp, cutting blow coupled with rapid infiltration of the enemy's area is desired rather than the mass attack along a lineal front. More boldness is indicated in driving to the heart of the objective with no regard to securing the flanks; maneuver and superior fire power should be employed for safety of the force. The armored force must be married to Army aviation, and, in fact, the command post may well be airborne where the commander can get a better feel of the situation, control dispersion and concentration as required, direct the employment of his atomic guided missiles and tactical air, and direct the drone tanks. These remotely controlled scouts will seek out avenues of approach; test suspected minefields, enemy strong points, and radioactive areas; provide mass groupments for saturating the enemy's defensive fires; and—armed with static atom bombs—can be directed to critical targets and detonated by remote control.

This brief discussion of tanks and the armored force serves only as an example of the thought required to make our ground force a real atomic threat. The artillery arm has already made important strides in this respect. The same approach can be profitably extended to the ordnance of our infantry, airborne, and amphibious forces. Atomic ordnance must be employed to do the job at every level of our tactical units. Additionally, military

thought of tactical atomic implications must extend into the areas of organization, formations, and tactics.

We must be alert to the specious arguments of the "big bang" adherents who will say that air and missile-delivered atomic ammunition gives us greater economy in the use of atomic energy; that expenditure of nuclear power is not profitable in smaller weapons. This argument can be placed in proper perspective only when we appreciate the objective of an atomic-powered ground force—alleviating our manpower shortage. We should not be satisfied with half measures in the atomic-arming of such a force; true economy is attained only by ensuring victory on the battlefield. Manifestly, if we accept the possibility of the return of war to the battlefield, we must look to the organization of military forces tailored to this requirement.

This is not to say that we can ignore our other arms. Strategic forces and the means with which to effectively deliver the weapons of mass destruction to the enemy's homeland must always remain in being. This is the requirement for national survival. If we let down our strategic guard, we become easy prey to the enemy's atomic attack. But tactical military forces are required when nations resort to limited or peripheral war as an instrument of national policy. Because such wars tend to ground combat for decision, we must look to the weapons system of our ground forces. Thus, it becomes apparent that economy in the atomic age must be based on the effectiveness of the weapon on the target system we expect to encounter, not on the cost of manufacturing the ammunition.

It is inevitable that we should ask the question, "What happens when a full line of tactical atomic weapons becomes available to the ground forces of both power blocs?" In the first place, we should put off this day to the distant future by mov-

ing into this field quickly and with vigor; thereby maintaining a dominant position in this area as long as possible. However, if the day should come that the enemy matches us in this respect, we in the West still will retain the advantage because the problem of tactical war will have been placed on more of a technological basis, rather than on the employment of sheer human masses. Technologically, we can out-strip any country in the world, and with allied manpower assistance we can stay well ahead of the enemy.

On the other hand, if the enemy should acquire tactical atomic superiority before we do, that factor, coupled with a stalemate in the use of strategic atomic weapons, could well spell doom for our way of life.

Population and Manpower

The requirement for more and more military power in the conduct of modern international relations makes it mandatory for the two opposing blocs to seek more and more allies and bases. This aim to pool human, technological, and natural resources is really the essence of the cold war which has split the world into two armed camps. The bloc that is most successful in organizing the decisive political and economic strength of the world will win. Let us discuss the most important element in this respect—people.

Human resources have been and will continue to be a paramount factor in war. No matter how much mechanization is involved in the military art, it will require people to build, maintain, and operate these machines. There can be no substitute for human skills and leadership, for manpower is the very essence of military power.

Because of the fact that Western civilization was the first to industrialize, the peoples of the West sprang forward in world affairs. Their ability to apply industrialized, military power through the vehicle of modern methods of transporta-

tion gave them the capability to dominate the peoples of Asia. The awakening of Asia to the prospects of nationalism and industrialization has already made an impact in world affairs. There is nothing in the make-up of the Asiatic that precludes his effective industrialization. Japan, in her history of the past century, presents a good example of what can be accomplished in this respect under the most adverse conditions of lack of indigenous raw materials in a short time. The presence of rich raw materials in other areas of Asia creates conditions even more favorable to industrialization than those found in Japan.

Coincident with her awakening, we find Asia is forging ahead in population increases at a tremendous rate. One-half of the 2½ billion people in the world live in Asia. In 50 years, the population of Asia will be greater than the present total population of the world. During this same period the populations of North America and Europe will advance only fractionally. Asiatic birth rates continue as Western birth rates drop. The introduction of sanitation and medicines to Asia will lower the death rate. The introduction of modern local transportation systems will preclude famines as food will be more easily transported from area to area. None of these factors are at work for North America and Europe as these areas have progressed beyond the point where they assist in increasing the population.

However, it is not necessary to await the industrialization of this area to foresee its importance in world affairs. Already its population masses are making a profound impression in the form of huge and effective ground armies. Chinese successes in limiting the United Nations forces in Korea, and the Vietminh ability to stand up to the French for 7 years in Indochina are the most important political and military factors in Asia today.

Manpower Requirements

Much has been written about the manpower requirements in the atomic age. Do we need more men in the military services, or can the job be done with fewer? The evidence appears clear and abundant that the strategic capability must be in addition to the tactical forces. To rely upon only one of these two forces to the numerical detriment of the other would be folly indeed. A nation is protected militarily only when it is strong in all departments. There is no evidence that an enemy will be so considerate as to select a method of warfare in which the opposing power is strong. On the contrary, the enemy traditionally selects those methods of warfare through which he can exert the greatest strength to overcome the opponent's weaknesses.

However, to pursue the problem further, is there a manpower savings in the tactical forces where nuclear weapons can replace conventional types? A superficial approach might tend to an answer in the affirmative for it can be argued that a nuclear bomb does the damage of many conventional bombs; a battery of atomic cannon is the equivalent of many batteries of artillery; that guided missiles require fewer personnel than manned aircraft; that "near misses" of atom bombs do the job as well as the pin-point accuracy of conventional bombs—thus less effort and fewer fire missions are required.

The fact of the matter is that the introduction of nuclear weapons to the battlefield will require more, rather than less, manpower. Simply stated, nuclear weapons do more damage against personnel and matériel in a shorter period of time. With both sides using these weapons, each will suffer more casualties and each side will require more labor force to decontaminate and repair the devastating destruction that will ensue. If we take a situation where one force employs tactical atomic weapons systems while the

enemy does not, then the question is academic. The force with the atomic weapons will win, hands down. But such military advantage would be only temporary. Consider the fact that the long bow, the cannon, the repeating rifle, and other revolutionary tactical weapons did not long remain the exclusive property of a single country.

Summary

In summary, then, the destruction of one nation by another through the use of fire power was neither the objective nor a possibility for the powers engaged in World War II. This is no longer true. The existence of atomic weapons to include thermonuclear types, coupled with effective means of delivery, make possible the complete destruction of nations. Since this destructive capability is available to both great power blocs—regardless of who initiates the attack—it is reasonable to assume that a stalemate in their use will exist as long as both blocs maintain rationality, or until some time in the distant future when a complete defense against these weapons has been developed by either side.

The possibility of limited war, the re-

turn of warfare to the battlefield on the scale of the Korean conflict, calls for a re-evaluation of the organization of modern military forces. It necessitates study in the tactical employment of atomic weapons so that military victory can be achieved promptly on the battlefield. The attrition of long sieges is archaic and serves only to prolong the friction which, in itself, is the greatest danger to extension of the conflict beyond the battlefield.

The most important element in war is man. It would be folly to depend on technological progress alone as a defense. The stock-piling of manpower through the device of combined allied efforts is as important as any other preparation for survival in modern war. In this respect, Asia provides the greatest challenge to the two opposing blocs.

Finally, the atomic weapons are not a panacea for victory since both sides possess the key to this riddle.

Success will come to the side that can most intelligently grasp the significance of the changing nature of war, and plan searchingly for attainment of the maximum benefits in the diplomatic, strategic, and tactical arts.

At the same time, we must never lose sight of the elemental fact that, in the last analysis, victory in war depends on human beings. In this field, at least, there is a point beyond which the machine cannot be substituted for the soldier. It can increase his capabilities, it can magnify his effectiveness, but it cannot take his place. We must not fall into the error—potentially a fatal one—of thinking that in war we could replace manpower with machine power to the degree that we have done so in other fields of endeavor. There is no easy road to success in combat. The only way to win victory is to fight for it.

General Charles L. Bolte

MILITARY NOTES

AROUND THE WORLD

UNITED STATES

Primary Trainer

The Navy has selected the *T-34* as its new primary trainer in which its pilots will receive their first 70 hours of flying, including primary night flying and aerobatics. The 2-place tandem trainer is



Navy adopts *T-34* as its primary trainer.

powered by a 225-horsepower engine and has a top speed of 189 miles an hour. The low-wing, all-metal plane has a fully retractable tricycle landing gear. It will be painted a bright yellow as an anticollision measure. This trainer is also in production for the Air Force and for the military services of Chile, Colombia, El Salvador, and the National Safety Forces of Japan.—News release.

Gas-Turbine LCVP

For the past 3 years a gas-turbine-driven landing craft, vehicle and personnel (LCVP), has been undergoing tests at Annapolis and the Little Creek, Virginia, Naval Amphibious Training Base. The craft was equipped with a 160-horsepower, 220-pound gas-turbine engine instead of the standard Diesel motor and was found to perform almost equally as well as the standard model. Maneuvering, crash, speed, and beaching tests showed that except for minor differences, the gas turbine lived up to expectations.—MSTS.

Antisubmarine Seaplane

The *Marlin P5M* is the first production model of the Navy's largest antisubmarine seaplane. It is equipped with the latest electronic devices to search out enemy submarines and is armed with a lethal load of depth charges and rockets for the kill. The plane's high "T-tail," in which the horizontal surfaces in the tail assembly are attached to the top of the fin, rather than its base, gives it a distinguishing feature. This is expected to reduce drag on the tail. A reduced bow line cuts down the height of spray generated during water maneuvers and is expected to increase propeller life.—MSTS.

Larger Cargo Space

A new helicopter model, the CH-1, differs from existing small planes of this type in that the engine is mounted ahead of the main rotor drive in a manner suggestive of fixed-wing airplanes. This arrangement offers easy access for engine



Engine placement gives more cargo space.

servicing and provides a great deal of cargo space immediately behind the pilot and co-pilot and close to the center of gravity. It is an all-metal machine which employs a single main and a conventional tail rotor. Performance figures have not been released.—News release.

Basic Training

Plans are being developed by the National Guard Bureau whereby privates in that organization would be enrolled in a basic training "school" in much the same manner in which they are now sent to other Army schools. Under the plan, National Guard recruits would take 8-weeks' basic training with active Army training divisions. Most of the Army-conducted training would take place during the summer months since most of the men would be in the 17-18½ year old category and still of late high school age. The plan is still in the formulative stage and a definite decision on its feasibility will not be made for some time.—News release.

'Dryland' Submarine

An electronically operated "dryland" submarine trainer will be used by the Navy to train its future undersea warfare experts. The "simulator trainer" is anchored to a land-based cradle and will never get wet; however, it will give its users many of the experiences they can expect to find at sea. An instructor at a control panel can reproduce almost any problem that an operating submarine would face.—MSTS.

'Gee-Whizzer'

A small day fighter, designed to win local air superiority over the battlefield, the XF-104 is a new entry in the light-weight jet plane race. Weighing about 14,000 pounds combat-loaded, it is powered by a J-65 engine, blasting out more than 7,200 pounds of thrust. The speed is secret, however, the Air Force has said that the plane, dubbed the "Gee-Whizzer," is supersonic in level flight. Because of new rockets, each of which packs the killing power of half a dozen World War II machine guns, the designers have been able to save weight on heavy gun mounts, guns, and ammunition. All safety gadgets or instruments have been left in the plane. It has been flying secretly since last February.—News release.

Increase Lift

A simple system which controls the flow of air over the wing has increased the lifting capacity of jet planes and permits them to carry 1½ tons more armament and land at slower speeds. The system, perfected by a Navy engineer, is undergoing tests aboard an aircraft carrier. It bleeds air from the jet engine through holes in the duct and forces it out at high speed over the trailing edge of the wing, thereby tending to reduce turbulence by making the normal flow of air hug the wing rather than "burbles" when the plane is at slow or near stalling speeds.—MSTS.

Universal Landing Gear

A simple modification made to the conventional landing gear of standard aircraft will permit the plane to alight on land, water, ice, snow, or mud. The equipment, called the Universal Landing Gear, looks like a pair of skis. A ski-like attachment is made to each landing strut so that the wheels can still be used for regular airport landings. When water landings are to be made, the skis will support the plane on the water up to speeds of approximately 15 miles an hour, depending on the plane. Before this critical speed is reached, the plane must taxi up to the beach, ramp, or float where it is to come to a complete stop. The stopping area needs to be only about three plane lengths for safe landing and take-off operations. Water takeoffs are made by starting on the short ramp and then skiing on the water until airborne. One advantage seen in the process is that it will permit the dispersal of military aircraft to outlying water areas without the cost of expensive runway facilities.—*Aero Digest*.

Camouflage Net Sets

A "family" of camouflage net drape sets, designed to adequately conceal all field and antiaircraft artillery weapons and their associated equipment, can be erected in the maximum time of 30 minutes and dismantled in less than 15 minutes under blackout conditions by a normal size artillery gun crew. Designed by the Corps of Engineers Research and Development Laboratories, the sets can be erected in approximately 18 minutes and dismantled and packed for movement in 10 minutes in daylight. They are readily adaptable to being "tied-in" with natural foliage and provide effective concealment against visual and photographic observation, both ground and aerial, beyond 800 feet. They will replace the flat-top type.—News release.

Nuclear Powerplant

An experimental, full-scale but small nuclear powerplant, to be designed and built jointly by the Corps of Engineers and the Atomic Energy Commission, is to be erected at Fort Belvoir, Virginia. The plant is the prototype of a "package" or transportable power reactor which is being developed for use at remote bases, thereby eliminating the need to transport bulky conventional fuels. By locating the Army Package Power Reactor (APPR) at Fort Belvoir, a training facility has been provided that can be used in the regular program of the Army Engineer School located there. The reactor will be a pressurized-water type and will be constructed with provisions to eliminate any hazard to nearby communities. The plant, with a capacity of about 1,700 kilowatts of electricity, will be built of parts transportable by air.—News release.

Storage Facilities

During the next 2 years the Army will consolidate storage facilities and close 17 of its supply depots in the United States in a move which will reduce the annual operating costs of that service by 30 million dollars. Under the plan, five complete depots and parts of two others, located in areas where the Air Force has substantial requirements for new storage construction, have been allocated by Department of Defense to the Air Force. Another will be allocated to the General Services Administration for storage purposes. Other Army depots will absorb the workload of those being closed. The depots being inactivated include 19 million feet of covered storage space and 20 million feet of uncovered storage space. The reduced size of the Army, the recent adoption of new management techniques, and major increases in direct shipments from suppliers to users, thereby eliminating depot handling and storage, are the reasons given for the cutback.—News release.

Vertical Takeoff

The Navy's *XFY-1* delta-wing experimental fighter plane has left its tethering ring and made the first free vertical takeoff in history. The plane is designed to operate as a convoy escort fighter and is capable of taking off from the after deck of an ordinary cargo ship. Before



Vertical take-off plane makes first flight.

flight it rests on caster-like wheels at the tips of its fins and delta wing. A specially designed turboprop engine which drives a turboelectric contrarotating propeller lifts the *XFY-1* straight up in takeoff and pulls it at speeds of more than 500 miles an hour in level flight. When landing, the plane is pointed skyward again and backed down to a landing in no more area than it needed for takeoff. Its horizontal flight tests are to be conducted after additional vertical take-off tests. The *XFY-1* is one of two such craft, the other being the *XFV-1*, which is scheduled for test flights in the near future.—News release.

Turboprop Transport

The *YC-124B*, built as a flying test bed for a new propulsive system to be employed in the *C-133A* which will be produced for the Air Force, has demonstrated the superior capabilities of turboprop power for large cargo transports, it was reported recently. Performance details were not released but it was pointed out that the forte of turboprop powered airplanes is the economic transport of huge payloads over long distances. For most



Turboprop plane gives high performance.

purposes the best long-range performance for the plane is obtained at the highest altitude and the highest power allowed. Flight operations will involve a strenuous high-power climb to the initial cruising altitude. A continual but gradual climb will be made for the remaining distance in order to take advantage of the changing cruising ceiling as the weight is reduced by fuel consumption.—News release.

Underwater Television

The Navy is utilizing underwater television equipment and techniques in many kinds of work including bottom observation, object identification, salvage, submarine rescue operations, and marine biology. The underwater cameras are equipped with remote focus, aperture, and lens change controls.—MSTS.

Approve Uniform

Black shoes, socks, and necktie will be worn with the new Army Green uniform and approval has been given for the wearing of gold "scrambled eggs" on the visor caps of officers in the ranks of major and above. To assure uniformity, the Army Green outfit will be authorized in serge exclusively, although there will be an option as to the weight of the cloth. No date has been set for the integration of the uniform on a worldwide basis; however, it is estimated that it will take about 18 months for the first issue of the new garb to soldiers. Present plans call for issuing the new uniform to enlisted personnel on a limited basis late in 1956. General officers will wear gold bullion trimming, while field grade officers will wear trimming of rayon or nylon, which is much cheaper.—News release.

Industrial College

A correspondence course has been established to extend the facilities of the Industrial College of the Armed Forces to those who cannot avail themselves of the resident course and who may serve in key positions during an emergency. Eligibility for the course includes officers in the grade of major or lieutenant commander and above of all components of the Department of Defense; civilians of Government agencies; educators, industrial executives, and prominent citizens who may serve in Government or in the civil economy during an emergency.—News release.

Publication Plan

By an extensive revision of publication and distribution procedures and by consolidating Army and Special Regulations, the Army is expected to save more than half a million dollars and 90 tons of paper. The present Army and Special Regulations will be combined into one series of Army Regulations, thereby eliminating over 600 pamphlets.—News release.

Transonic Trainer

A transonic jet trainer, a modified version of the *F-86 Sabre Jet*, has recently made its first test flights. The new plane is designed for advanced pilot training in



Transonic jet trainer takes to the air.

high-speed flight, gunnery, and dive bombing. It is a 2-seat model rated in the 650 mile-an-hour class, with a maximum service ceiling of 45,000 feet, and a combat radius of more than 600 statute miles. Its turbojet engine has a thrust exceeding 5,800 pounds.—News release.

Self-Luminous Markers

Self-luminous markers, which can be easily seen on the darkest nights, may be developed from Strontium-90, a radioactive material which produces luminescence, according to the Naval Research Laboratory. The new product may be used for marking deck stations, equipment, personnel, or ammunition. It can also be used for signaling or identification during amphibious operations, or to mark life rafts to aid air rescue teams. Strontium-90 is better for markers than radium because it is safer, brighter, longer lasting, and can be used in a variety of colors. Already five different colored markers have been tested by the Naval Research Laboratory, and a green one, 1 1/4 inches in diameter, could be seen 1,000 feet away on a clear moonless night.—MSTS.

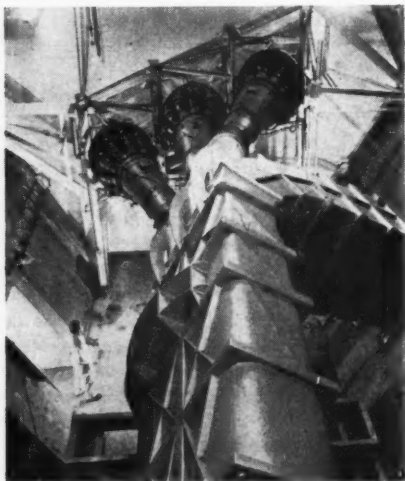
GREAT BRITAIN

Radar Device

A radar device known as "Rebecca," developed during World War II for aircraft supplying agents in enemy territory, has been adapted for jet fighter planes. The new model weighs only 40 pounds and works on the compass principle without use of a bulky screen. It has a range of 200 miles and a margin of error of 4 percent. Within that radius, the pilot can determine his exact distance from base and get a homeward bearing at a glance.—News release.

Wind Tunnel Power

In order to reduce capital costs and reduce building time, jet engines, instead of the conventional electrically driven compressors, are being used to power a new high-speed wind tunnel by a British aircraft company. The wind tunnel is driven by three jet engines which exhaust



Jet engines provide power in wind tunnel.

into the working section of the tunnel to provide the rush of air for high-speed tests.—News release.

Artillery Tractor

The British Army in the field will soon receive an artillery tractor which is intended to replace the *Matador*. The new tractor is powered by a Rolls-Royce engine and has a 6-wheel drive which gives it remarkable cross-country performance. When fully loaded, it can climb gradients



Cross-country performance is rated high.

of one in three. The cab will carry a complete gun detachment. Supplies and ammunition will be carried in the rear canvas-covered compartment. The tail-board is in three parts so that each can be lowered separately for easy loading and unloading.—News release.

International Fighter

A supersonic jet, the *Hunter*, rated one of the world's fastest fighters, is soon to fly with the air forces of five countries. The countries to get the plane are the Netherlands, Belgium, Denmark, Sweden, and Great Britain. In the Netherlands and Belgium, the *Hunters* are to be built as part of a NATO contract. Denmark has placed an order for the planes of approximately 8½ million dollars, while Sweden has placed an order of about 33½ million dollars. The plane is already in superpriority production for the Royal Air Force and deliveries to the other countries are expected to be spread over the next 2 years according to the report.—News release.

THE NETHERLANDS

Air Defense Budget

The air defense budget of the Netherlands allows for an air force of six interceptor squadrons, three all-weather fighter squadrons, six tactical fighter bomber squadrons, one transport squadron, two reconnaissance squadrons, and four artillery observation squadrons. The Air Force will get approximately 254 million dollars for the procurement of new fighters and radar equipment. By the end of this year, it is expected that 70 percent of all first-line aircraft will be ready.—*Aviation Age*.

PAKISTAN

To the Right

In keeping with the majority of the countries of the world, it has been decided that henceforth all vehicles in Pakistan will be routed from the left-hand side of the road to the right. It was stated that driving on the left-hand side of the road was only prevalent in Sweden, the British Commonwealth countries, and British possessions, except Canada and Ceylon. In all the other countries of Europe, the Middle East, the North American Continent, Latin America, and the Far East driving is on the right-hand side of the road.—News release.

ARGENTINA

Aircraft Industry

The state controlled aviation industry is now actively engaged in drawing up plans for the manufacture of civil and military planes among which are the *Pulquí II* jet plane, the *I.A.e34 Justicialista del Aire*, and supersonic planes. The Ministry of Aviation announced that the industry was building a supersonic fighter that was capable of flying at speeds of over 800 miles an hour. The plane will have a delta wing, be powered by two jet engines, and be of all metal construction.—News release.

USSR

Plane Developments

A twin-engine jet fighter, designed by Mikoyan, is a new plane reported to be standard equipment for several Air Force regiments. One of these units is stationed near Sale Khard, at the mouth of the Ob River in northwestern Siberia. As airfields in this area are free of snow and ice only a few weeks of the year, fighters based there are equipped with skis for takeoff and landing. Another new development is a long-range reconnaissance plane, the *Mi-13-RD*, which has been delivered to a few of the Soviet Strategic Air Command's reconnaissance squadrons. The craft is a modification of the Miassishchev *Mi-13* long-range turboprop bomber. The main difference is the diesel powerplants found in the new model, developed from the German Junkers *Jumo-224*, which give a range of 8,700 to 9,900 miles and excellent altitude performance. The *Mi-13-RD* is reported to be comparable in configuration to the *RB-50* of the United States Air Force. Its dimensions are somewhat larger, but the weights are about the same. It cruises at 340 miles an hour.—*Aviation Age*.

Flying Boats

The development of flying boats is being emphasized in the Soviet Union, a country which has no aircraft carrier fleet to speak of, according to recent reports. Presently undergoing landing and take-off tests on the Amur River, between Komsomolsk and Khabarovsk in Far Eastern Siberia, is a 4-jet, long-range reconnaissance type flying boat. It is designed by Tupolev and the powerplants are buried in the plane's swept-back wings. The craft uses at least one braking parachute in landing. Several Soviet Air Force units stationed along the country's north Pacific coast and in the Bering Strait area already are equipped with twin-jet flying boats.—*Aviation Age*.

TURKEY

Merchant Fleet

Orders have been placed with foreign shipbuilding yards for seven new passenger ships and three freighters by the Turkish Maritime Bank. Of the passenger ships, three are to be 5,000 tons, two to be 7,000 tons, and two to be 10,000 tons, while the freighters are to be from 3,000 to 5,000 tons each. The Maritime Bank is a private corporation, chartered for 99 years, with a capital of nearly 177 million dollars, which took over the administration of that portion of the Turkish merchant fleet which was previously operated by the Government's State Shipping Lines in 1951. Since then, the concern has built five vessels ranging from 1,500 to 5,000 tons at its own shipyards in Istanbul, and has four more under construction.—News release.

Ammunition Order

An offshore order for approximately \$875,000 worth of ammunition to be manufactured in Turkey has been placed by the United States Army Procurement Center in Germany. This latest contract raises to about 8 million dollars the total value of orders placed in Turkey to date by the United States within the framework of the infrastructure defense program.—News release.

EAST GERMANY

Air Force Strength

A recent British white paper put the strength of the East German Air Force at 7,500 men. Soviet primary trainers reportedly used by this force are the Yak-2 and Yak-18.—*Aviation Age*.

JAPAN

Military Procurement

A procurement office has been established in Tokyo by the Philippine Government to buy military equipment from Japan.—News release.

NORWAY

Defense Matériel

Norwegian munition plants were recently awarded offshore contracts totaling 3.9 million dollars as part of the United States Mutual Defense Assistance Program. One firm received a contract for 2.2 million dollars for the production of 40-mm L70 Bofors antiaircraft guns, while another company received over 1.7 million dollars to make 30- and 50-caliber small arms ammunition. These items have been adopted as standard for NATO forces.

Since May 1952, Norway has been awarded offshore contracts worth over 22 million dollars.

Production of the L70s will begin as soon as the new assembly plant of the company is completed. The ammunition is to be made in an underground factory which covers about 18,000 square feet. The plant, located about 200 feet below the ground, began production early this year.—News release.

Telephone Cable

A new, 36-line submarine telephone cable is being laid between Norway and Scotland.—News release.

Aluminum Plant

With the completion of a new aluminum plant at Aunndalsora, Norway hopes to increase its aluminum production from the present 55,000 tons to 100,000 tons a year. Most of the aluminum is exported.—News release.

AFGHANISTAN

Aid Offer

The underdeveloped state of Afghanistan was reported to have been offered 250 million dollars of "point four" type of aid by the Soviet Union. This important buffer state, which lies on the southern border of the Soviet Union, was said to be considering early acceptance of the offer.—News release.

INDIA

Reopen Rail Link

The rail link between India and West Pakistan, closed for the past 7 years, is expected to be reopened soon. Since the partition of the two countries closed the rail link between Amritsar and Lahore, travelers have had to make their own way across the border to board the train on the other side.—News release.

BRAZIL

Atomic Installation

The first plant for refining uranium-bearing minerals and the production of metallic uranium in Brazil is to be built in the Pacos de Caldas region of the state of Minas Gerais, it was disclosed recently. The new plant will be a pilot installation intended chiefly for the purpose of training teams of nuclear experts. The plant is also designed for the production of sufficient quantities of uranium of "nuclear purity" to permit construction of experimental nuclear reactors. It is planned that the atomic energy program of the country will be carried forward by progressive stages. Other facets of the program aimed at achieving nuclear power are the training of nuclear physicists in cyclotron and allied techniques at the atomic center now being constructed in Niteroi and extensive surveys for nuclear ores. The Niteroi center houses the 21-inch synchro-cyclotron with a potential of 6.5 million electron volts. Mineral surveys in nuclear-ore-rich Brazil are carried on by up-to-date aerial techniques, including magnetometric and scintillometric methods. Among the most promising sources of such ores is the state of Minas Gerais.—News release.

Freight Cars

It is planned to buy 300 new cars to provide better freight service in the area between São Paulo, Rio, and Minas Gerais.—News release.

FRANCE

Hunter-Killer Aircraft

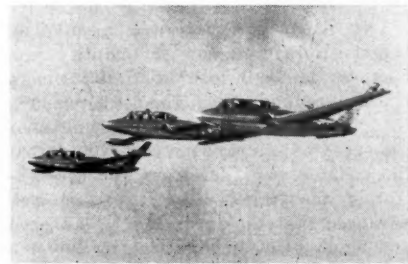
A carrier-based attack aircraft, designated the *Vultur*, is under development for the French Navy. The plane will carry two radar operators in addition to the pilot. Armament of the hunter-killer aircraft will consist of rockets, depth charges, and bombs. It is powered by one *Mamba* turboprop engine. If tests of the prototype prove successful, there may be a production order to equip the carriers loaned to France by the United States Navy.—*Air Training*.

Crash Sound Barrier

The night interceptor prototype, the *Mystère IV N*, has crashed the sound barrier on its third flight according to recent reports.—News release.

Liaison Jet

The first 4-seat jet liaison aircraft, the *Morane-Saulnier 760*, is presently undergoing flight tests. The new plane is derived directly from the *Fleuret*, a light,



Flight tests begin for 4-seat liaison jet.

2-seat jet trainer. The *760*, with wingtip tanks, is able to fly 870 miles at more than 310 miles an hour at an altitude of 20,000 feet. It retains the acrobatic coefficient along with the servicing and maintenance advantages of the *Fleuret*. The plane can be used for liaison, reconnaissance, photographic surveys, training, and hauling light cargo.—News release.

AUSTRALIA

Civil Defense

After consideration of reports on various aspects of civil defense, the Federal Government is planning to set up a civil defense school as a first step in the establishment of a Civil Defense Organization in Australia. A conference between Federal and State ministers will be called to discuss their respective responsibilities in the matter. It was explained that much of the knowledge gained at the school would probably be useful for peaceful purposes also.—News release.

Uranium Export

The first exports of high-grade uranium oxide to the United States and Great Britain from South Australia are expected to be shipped early next year. It is planned that the area's 14 million dollar uranium mine and concentration plant at Radium Hill will begin full production shortly.—News release.

Target Aircraft

The Australian *Jindivik*, a pilotless target aircraft, is now in quantity production. It is in use at the Woomera testing grounds as a high-speed, remotely controlled target aircraft operating near the speed of sound. It was reported that the radio devices developed for the control of the target aircraft are so well advanced that the plane can be launched and maneuvered in flight to simulate the evasive tactics of enemy aircraft and landed again without incident.

It is powered by a *Viper 100* engine producing 1,640 pounds thrust. The craft contains radio control equipment, automatic pilot, and telemetering equipment. The radio control installation consists of several small units in hermetically sealed package form which may be installed by unskilled personnel, according to the announcement.—*The Aeroplane*.

THAILAND

War College

A national war college for training high level civil and military officers in defense against an invasion is to be organized in Thailand. In the 10-month course it is planned to cover military and economic affairs, international politics and organizations, foreign policy, geographical areas, and similar subjects.—News release.

SOUTH AFRICA

Recruiting Drive

An intensive Union-wide drive to recruit men for all branches of the South African Armed Forces is presently underway. During the course of the drive, recruiting staffs of the Army, Navy, and Air Force will visit 79 centers. Literature will be sent to all schools not included in the immediate itinerary.—News release.

Export Beryl

More than 2,500 tons of beryl were exported to the United States last year by South Africa and Southern Rhodesia. Beryllium, the important industrial metal, is extracted from beryl and is used in the manufacture of strong, hard alloys. The metal also plays an important part in the production of nuclear energy.—News release.

CANADA

Harness Power

Application has been made to the Government of British Columbia for a water rights license to the British Columbia section of the Yukon River watershed. The company making the application plans to convert the northern wasteland into a power supply for a multimillion-dollar Canadian metallurgical industry. The plan calls for the harnessing of the watershed extending 200 miles north and south and 300 miles east and west which will develop 4,300,000 horsepower.—News release.

FOREIGN MILITARY DIGESTS

A Study of Commanders and Staff Officers

Digested by the MILITARY REVIEW from an article by Major C. S. Glew
in the "Canadian Army Journal" April 1954.

WHENEVER and wherever soldiers gather to talk, the subject of commanders and staff officers, and their relationship is frequently introduced. One school of thought maintains that some officers make good staff officers but not good commanders; and further, that some officers are good commanders but not good staff officers. Conversely, there are those who think that the characteristics of good commanders and good staff officers are synonymous. This article tells why I support the latter viewpoint, and why I feel that the former has little ground for justification.

Definitions

It is important, I think, first to define clearly officer, commander, and staff officer. Field Marshal Sir William Slim, former Chief of the Imperial General Staff said: "Remember, that the be-all and end-all of an officer is to be a leader. The qualities that distinguish an officer from other men are courage, initiative, will-power, and knowledge." A commander may be defined as an officer who directs

a body of troops on the Queen's business. A staff officer is an officer who aids a commander in his tasks. Obviously a man cannot be a good commander or a good staff officer without being a good officer, but he must also possess certain additional qualities.

Qualifications for Commander

The following qualifications for command, I feel, are of primary importance.

1. *Leadership.*—An officer imbued with "high ideals, a complete and sympathetic understanding of his men, the velvet hand in the iron glove, a willingness to accept responsibility, a good turnout and a healthy attitude, ability to make decisions, a wholesome degree of humility for his own shortcomings, respect for his men, ability to take a crack in the shin" has the spark of leadership.

2. *Competence.*—Many of the mistakes made by the French forces in the Seven Years' War were, according to Count Victor Maurice de Broglie, Marshal of France, 1647-1727, the direct results of the "complete ignorance of the officers, from sub-

lieutenants to lieutenant-generals, of the duties of their positions and the details of which they ought to be masters."

3. *Planning Ability.*—The ability to plan a battle before it starts is an essential requirement of a good commander. Transformation of the battlefield through mechanization, and the growing complexity of modern warfare, emphasizes the need for sound, accurate planning at every command level.

4. *Knowledge of the Mechanics of War.*—"It is knowledge of the mechanics of war, not the principles of strategy, that distinguishes a good leader from a bad."

5. *Administrative Ability.*—"Since it is a function of command, the commander has a direct and definite responsibility for the administration of his forces. He must, therefore, understand the scope and ramifications of modern administration . . . should ensure that his administrative arrangements are equal to the stress which may be imposed upon them."

6. *Fighting Spirit.*—" . . . no method of education, no system of promotion, no amount of commonsense ability is of value unless the leader has in him the root of the matter—the fighting spirit."

7. *Experience.*—The story is told that after the Seven Years' War, Frederick the Great was approached by one of his officers, who stated that he felt that he was long overdue for promotion, giving as the reason the fact that he had participated in every battle of the Seven Years' War. To this Frederick is said to have replied, "I have a commissariat mule that has done the same thing, but he is still a commissariat mule." This officer had experience, but experience alone did not qualify him for command.

Other qualities, as listed by Field Marshal Wavell, include:

Courage, physical and moral; health—is a relative quality only; youth—a good young general will usually beat a good old one; character—he knows what he

wants and has the courage and the determination to get it; interest in and real knowledge of humanity; the will to win; a touch of the gambler.

While attempting to define the essential qualifications required of a commander, I perused the pages of history to see how they had been defined before. I read a number of expositions by various writers, military or otherwise, of the virtues considered necessary for commanders. One apt description is attributed to the famous philosopher, Socrates. It read as follows:

The general must know how to get his men their rations and every other kind of stores needed for war. He must have imagination to originate plans, practical sense and energy to carry them through . . . He should also, as a matter of course, know his tactics; for a disorderly mob is no more an army than a heap of building materials is a house.

I notice that Socrates placed more emphasis on administration and planning than on tactical ability. Many military men reverse the order.

The French believe that *le sens du practicable*, or commonsense, is the most important qualification. But commonsense is merely an accurate appreciation and sound knowledge of the mechanism of war; that is, topography, movement, and supply.

Many of the qualities which are believed to be the attributes of a good commander are those of a good officer. We cannot say that to be a good commander an officer must have all these qualities in equal degree. Major General C. Vokes—one of Canada's top military men—has said:

No two men are exactly similar and their reactions to any particular set of circumstances will never be exactly alike. They may be aggressive or cautious; quick off the mark or slow. They may be stubborn in their views and argumentative or

the opposite. They may be self-reliant or slow to assume responsibility.

And there are many commanders who do better according to the level at which they function. Field Marshal Wavell says of this:

There are many generals who are excellent executive commanders as long as they are controlled by a higher commander, but who get out of their depth at once, and sometimes lose their nerve, if given an independent command. Others are difficult subordinates but may be trusted on their own.

To sum up these qualifications for commanders, we may say they include "character, imagination, commonsense, initiative, responsibility, administrative, planning and tactical ability, swift and vigorous reaction, the feel of the fight. His role is to decide, to plan and to conduct."

Evolution of the Commander

We have listed the characteristics required in a good commander. But is there something still further needed? History reveals a parade of officers who led troops successfully, many of whom had most of the qualities listed, and yet in the light of present-day requirements might not measure up to the standard. "The Crusades (1096-1271) produced a number of fabulous soldiers of fortune who from the military standpoint were little else." The Germans, by 1918, had realized that "large armies are no better than the staffs which control them." French military leaders have long appreciated that a workable staff system is a fundamental requisite of an efficient military organization. "One of the outstanding lessons of the World War from a naval point of view was the necessity for not only training officers to fill numerous minor staff appointments but also to educate those destined for higher command in the use of a staff." Lieutenant Colonel J. D. Hittle, Ameri-

can military writer, points out that "today the greatness of a general is largely dependent on his knowledge of how to use his staff."

Thus, we see that being a commander today involves more than just personal courage and men to lead. There will always be leaders who will be able to inspire men to take the last chance or fight on to the death if necessary. In some periods of history they would have been considered good commanders. However, today a commander must be able to keep a complex military machine functioning smoothly. To do this, he must be capable of directing a staff, and to do this well, he must be educated in staff techniques and understand fully the intricacies of staff functioning and the far-reaching problems of administration.

History records many examples of officers who have not been staff trained. A critical reading of that period of British history following the campaigns of Marlborough reveals that many commanders achieved success on the field of battle as individuals, but not as products of a military system. "The entire period from Marlborough to almost the end of the eighteenth century was characterized by chronic disorganization in military administration, all of which placed a severe handicap on the efforts of ambitious field commanders." Apparently the British did not realize—as did the French and the Germans—that military efficiency must stem from the rest of military hierarchy. Esher's report—after the Boer War (1899-1902)—stated that the absence of trained staff personnel had "gravely prejudiced the conduct of operations in South Africa." It was further observed that commanders did not know how to employ the staffs they did have.

Of course there are exceptions. Schiefel-phen explains:

... some commanders have no need of counsel. They study the questions which

arise, themselves decide them, and their entourage has only to execute their decisions. But such generals are stars of the first magnitude, who scarcely appear once in a century. In the great majority of cases, the head of an army cannot dispense with advice.

In some cases "great individual commanders attained great victories, but their success was largely dependent upon the thinking done by them before the battle, namely, staff planning, which made it possible to achieve victory in the field." The ability to be a staff planner, then, is one more of the attributes required in a good commander. Without it he may win local battles, his tactics may be superior to that of his opponent, but, like Rommel in the desert, he will not win ultimate victory. Victory will belong to the commander, who, in addition to possessing the requisite requirements, will also have staff ability. Sir William Nicholson, a former Chief of the Imperial General Staff, submitted, in 1908, a memorandum regarding educational preparation for command and staff duties which stressed the need for a common standard of military knowledge and uniformity in thought and practice; "this uniformity in training and thought can only be obtained by passing officers intended for General Staff work through a staff college."

Qualifications of a Staff Officer

As we have seen, no commander can successfully command if he lacks staff ability. Now, we must consider the qualities necessary to a good staff officer. Are they comparable to those of a good commander or do they differ in wide degree? *Staff Duties in the Field* lists the qualities needed: "The qualities required in a good staff officer are fundamentally the same as those required in a good regimental officer, but the following are of particular importance: loyalty, quick think-

ing, accuracy, commonsense, pleasant disposition, and imagination." Many famous military men, like General G. D. H. Crerar, have condensed the above description into two words, "loyalty and efficiency."

Brigadier General Thomas M. Vincent, United States Army, in a pamphlet published in 1870, said of the staff: "Its members should not only be men of great professional and general intelligence, but they should have a thorough special training, such as can only be obtained in schools instituted for that express purpose." Such schools have been established by most nations. The function of the Canadian Army Staff College is, for example, "to qualify officers for second grade staff appointments in all branches of the staff in field and static formations in time of war." The United States Command and General Staff College has as its primary mission, "to prepare officers for duty as commanders and general staff officers of divisions, corps, armies, and comparable levels in the communications zone."

A definition of the function of a staff officer varies widely with different nations. In Canada, we believe that the duty of the staff officer is to "assist the commander in the function of command, and to help both the fighting troops and the services in carrying out their tasks." In the United States, the accepted General Staff theory is "that General Staff officers assist their commander by giving him such assistance in planning, co-ordination, and supervision as he would do for himself were his capacity supernaturally unlimited." The Germans draw no fine line of distinction between command and staff training. As was demonstrated in World War II, "... it is no mere accident that the overwhelming majority of the German High Command are officers who have earned the coveted wine-red stripes of the general staff." The Germans further believe that the staff offi-

cer must be capable of regimental duty; "after the death of Frederick in 1786, Massenbach proposed that General Staff officers periodically revert to troop duty. The soundness of this suggestion has been vindicated by practically all present-day staffs."

Thus, we see that the conception of what is required of a staff officer varies with nationality. Qualifications which are universally recognized, however, appear to be:

Willing to sacrifice his own convictions; wide range of technical and tactical knowledge; sound and steady judgment and a calm mind; quick in conception and execution; a man of action, with outstanding physical resistance and endurance; tact, good manners, discretion, ability to gain good will; sincerity, veracity, and lack of emotion.

Colonel G. L. Muniz, in his *Command and General Staff Function*, neatly packages these attributes by saying:

The General Staff officer must possess a wide range of technical and tactical knowledge. All his endeavors should be based on foresight and a systematic arrangement of the facts. He must clearly evaluate the different aspects of the problem to be solved, and reach a proper solution without vacillation.

Comparative Analysis of Qualities

I have attempted to point out that many of the characteristics required in officers, staff officers, and commanders are common to all. The only qualities required in a staff officer that a commander need not possess in order to be successful are tact, lack of emotion, prudence, and a pleasant disposition. It seems in essence, then, that the ability of one officer to work in harmony with other officers is the only quality not common to both commanders and staff officers. Many examples can be found of successful military commanders who lacked this ability to work

pleasantly with others, but there is also evidence of the opposite being true. From our present-day point of view, when we consider that armies are international in make-up, it is apparent that our commanders must have this ability if we are to think of them as good commanders. There will be exceptions. Montgomery, Bradley, and Patton likely would have made a poor team, regardless of their individual abilities as commanders. From this we can deduce that a further and essential qualification which must be held in common by both commanders and good staff officers is an ability to become international in outlook.

If we examine the careers of some of the great captains of history, we find that most of them were both good commanders and good staff officers. "Hannibal, the greatest opponent Rome ever met, demonstrated his staff ability by crossing the Alps, with a full baggage train and elephants—one of the remarkable feats of history." General Robert E. Lee, one of the world's great commanders, served his staff apprenticeship as Superintendent of West Point and later as military advisor to President Jefferson Davis. Napoleon's "keen appreciation of organizational efficiency plus his operational brilliancy paved his road to the hall of military fame."

Of course, we can also find examples of good commanders who were poor staff officers. Major General Kazimiez says this of Rommel: "From the standpoint of staff and scientific preparation, Montgomery undeniably surpassed Rommel . . . Rommel was a blind go-getter, disregarding the importance of supply and air power." Referring to Cromwell, Major General Kazimiez says: "Cromwell showed little indication of possessing an appreciation of the intellectual preparation required for the maintenance of a truly professional field force."

Then again, throughout the history of

war, there have occasionally appeared good staff officers who were poor commanders. Berthier, as Napoleon's Chief of Staff, was one of these.

On one particular occasion, Napoleon dispatched Berthier to the Army Headquarters with instructions to assemble the forces in the vicinity of Ratisbon or Lech. On his own, possessing full authority delegated to him by the Emperor, Berthier proceeded to dispose the forces in so absurd a position that the experienced marshals were amazed. Fortunately Napoleon arrived in time to extricate the army before the Archduke (Charles of Austria) could force any action.

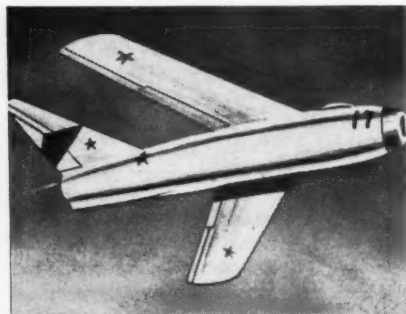
Conclusion

The pages of history record that by far the greater number of good commanders have been good staff officers. Some of them have been great captains, others lesser lights, but all have contributed, in some measure, to the art of warfare. I have tried to show that the qualities of a good commander and a good staff officer are synonymous, although exceptions to this rule can be cited. To me it appears that a present-day commander cannot be considered a good commander if he lacks staff officer attributes, nor a staff officer a good staff officer if lacking the qualities of a commander.

Soviet Jets

Digested by the MILITARY REVIEW from an article by Ian Morton in "Canadian Aviation" June 1954.

Two hundred is considered quite a mystic number these days by top-ranking Canadian defense experts. By "two hundred" we mean, of course, the Tupolev Tu-200,

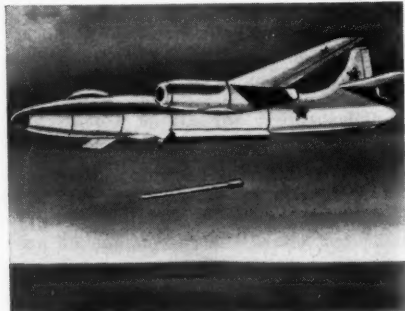


Escort work is the basic task of the La-17.

the Soviet Union's latest multiturboprop bomber. Prominently displayed at the 1954 May Day celebrations over Red Square, Moscow, the Tu-200 offered food for thought to those who believed that the Soviet Union was lagging behind on aeronautical developments. Here indeed was proof that the Soviets were capable of

striking deep into the heart of North America. Their cargo—the hydrogen bomb.

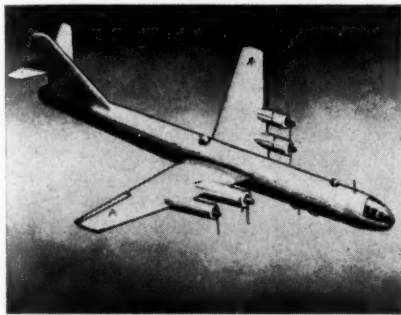
Recent Pentagon pronouncements have indicated that the Soviet Union is well advanced in all forms of thermonuclear research. It is not surprising, therefore,



Tupolev Tu-12 is latest Soviet Naval plane.

that a nation with the ability to produce a form of hydrogen bomb has devoted considerable effort to perfecting an aircraft to deliver the weapon. Such an aircraft is the Tu-200.

First, a word about the designation. Prolific as he is, Andrei Nikolaevich Tupolev has obviously not had 200 designs accepted by the Soviet Air Force. In point of fact, the number 200 probably repre-



Heavy bomber, *Il-38*, can carry atom bomb.

sents what is known as a TsAGI allocated type number—TaAGI being the Soviet equivalent of Great Britain's Farnborough.

At a first glance the new Tupolev bomber might be called "a conservative version of the United States Air Force *B-36*." Whereas the American aircraft has 10 mixed piston and turbojet engines, the *Tu-200* relies on six contrarotating turboprops to attain its estimated maximum speed of over 460 miles an hour.

Heavy Bombers

Aerodynamically, Tupolev's offering presents the logical "next step" from his earlier 4-motor *Tu-4*—itself an adaptation of the *B-29*. Fuselage shape, cabin contours, and disposition of gun turrets, all serve to confirm the *Tu-200*'s American lineage. It is in the fin design, however, that resemblance to current United States practice is most apparent. The graceful sweeping line of the leading edge bears an astonishing similarity to that of the Convair *Yb-60*, another strategic bomber in the 350,000-pound all-up-weight category.

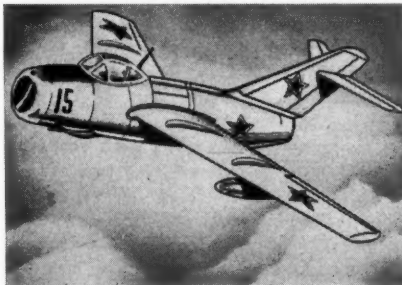
For a number of years, the Soviet Union has been testing various types of

radar bombing systems (currently on *Tu-4s*). The fitting of a large radome aft of the nose wheel doors on the *Tu-200* suggests that these experiments have been successful.

Bearing similar radar devices is an aircraft previously designated the *Il-38*. Spanning some 68 feet less than its "long-arm" stablemate, Ilyushin's entry in the heavy bomber field differs from the *Tu-200* by having four turboprops fitted in place of the larger machine's six. Wing sweepback is considerably greater, while both wing and tailplane have negligible dihedral. Again this aircraft has the "Convair sweep" to the leading edge of the fin.

How many of these probable atom carriers are in service? From the necessarily limited information available, we would estimate that approximately 25 *Tu-200s* were flying at the beginning of 1954. Production of the *Il-38* is not thought to be so well advanced.

Since the initial flight of the two pro-



Basic fighter of the Soviets is the *Mig-15*.

totypes, no evidence has been received to suggest the placement of a service contract.

In contrast, well over 1,500 Tupolev *Tu-4* variants are in operation as the mainstay of the Soviet Union's strategic air arm.

Dismissed by many as a "*B-29* copy," Tupolev's redesign of the American original was brought about by necessity and

chance. In 1944, three intact United States Air Force *B-29 Superfortresses* landed out of fuel at Vladivostok. Inexperienced in any except short-range tactical bombing, the Soviets appropriated the *B-29s* and took full advantage of the chance to develop a long-range strategic fleet speedily.

Since that time, the many versions of



Familiar transport is the Ilyushin *Il-12*.

the ageless *Tu-4* make interesting comparison with United States Air Force developments. One early modification was a specially equipped naval variant, many of which are still in use. Another was the adaptation of the *Tu-4* for paratroop dropping. At the 1951 air show at Tusheno Air Base, near Moscow, no fewer than 32 fully equipped troops were seen dropping from large ventral bags fore and aft.

While early series *Tu-4s* were powered by four 2,200 horsepower *ASh-90* radials (copies of the Wright *R-3350 Cyclone*), the more powerful *M-300s* are now reported to be the standard power plant.

With the introduction of the *M-300* development, A. N. Tupolev was directed to design an aircraft capable of carrying the atom bomb. His solution was to further extend the life of the *Tu-4* by refitting up-to-date bombing equipment and enlarging the bomb bay. This latter modification necessitated a change in fin area.

At least one *Tu-4* was fitted out as a flying test bed for the undesignated turboprop units fitted to the *Tu-200* and *Il-*

38. The mystery machine in the Soviet's big bomber development story is the *Tu-75*. Thought to be the latest and last of the *Tu-4* variants, this aircraft, whose designation is sometimes linked with the *Tu-200*, owes a great deal to the *Tu-70* transport.

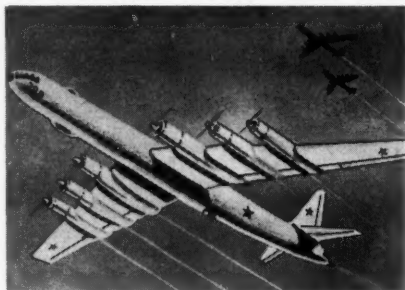
Little information is available regarding the 4-engine *Tu-75* other than the fact that the wing has a straight center section, and a "step-up" cabin of conventional design is featured.

Tactical Bombers

The major part of the Soviet Air Fleet, or *Sovietiski Voennovozdushni Flot*, is under the jurisdiction of the Army and, as such, is well equipped with close support tactical aircraft.

Of the five reported twin-jet types available, two were slated for increased production in 1954.

First of these is the *Il-28*, a straight-wing medium and high altitude bomber roughly in the British *Canberra* category. Its pair of bulky underslung nacelles house 5,953-pound static thrust *Wk-1*



The largest strategic bomber is the *Tu-200*.

centrifugal turbojets, development of the Rolls-Royce *Nene*. Among variants flying are included naval and night fighter versions with top speeds ranging from 530 to 580 miles an hour. A conversion trainer with separate cockpits in tandem is also widely used.

Another top priority airplane is the

swept-wing development of the *Il-28*. Little information concerning this machine is available apart from its visual characteristics.

Among the "doubtful" variety is a newly noted assault aircraft designed by Ilyushin, and intended as a replacement for the obsolete World War II *Stormovik* (*Shturmovik*). Unswept tail surfaces and



Ilyushin's new twin-jet tactical bomber. rounded wing tips distinguish this machine from the *Il-28*.

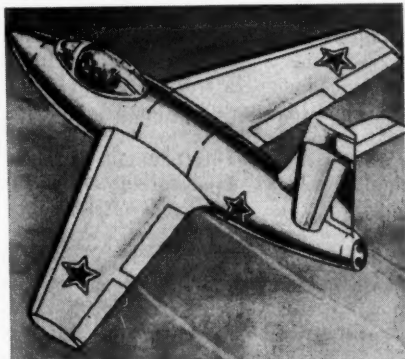
Well known is the fact that after the end of the last war, many top-ranking German aircraft designers were induced to carry on their work inside the Soviet Union. One such technician was Dr. B. Baade, who was connected with the development of the *Ju-287* twin-jet swept-wing bomber. In collaboration with A. N. Tupolev, he is reported to have produced one of the largest tactical bombers ever to enter service with the Soviet Air Force—the 98-foot span *Type 150*.

This unusual "all-swept" machine features two 10,000-pound static thrust turbojets mounted in wing pods, a departure from normal Soviet practice. The German policy of morale-boosting is indicated by

the closely grouped crew stationed in the glazed nose.

Realization that naval attack units can play more than a minor close support role to the Army has been slow in coming to the Soviet High Command. However, with the introduction of a new twin-jet, tentatively designated *Tu-12*, it is evident that up-to-date equipment priorities are at last being granted to Soviet naval aviation.

A contemporary of the *Il-28*, the Tupolev design makes use of the identical *Wk-1* turbojets installed in the former. From an aerodynamic standpoint, the *Tu-12*'s long slow fuselage, unswept pyramidal fin, and straight-wing center panels are the most striking changes over its predecessor. At least two torpedoes can be carried in its bomb bay, if the Soviets solve some of the problems of high-speed torpedo dropping. With a wingspan in the



Rocket powered *Yak-21* is for home defense. region of 70 feet, the *Tu-12* should be capable of task force operation from aircraft carriers.

Fighters

When Convair and Boeing heavy bombers were introduced into the United States Air Force, around-the-clock interception became of as much concern to the Soviet Union as the development of her strategic and tactical units.

The number one defensive-offensive all-

weather fighter is the swept-wing twin-jet, reportedly the third solo venture of Antem I. Nikoyan after the Nikoyan and Gurevich design team split up in 1947. This undesignated fighter's sleek lines are enhanced by the choice of mounting the 5,000-pound static thrust axial units on the fuselage sides, after the fashion of the Canadian *Cf-100*.

The only fighter attributed to N. I. Gurevich since his break from Nikoyan is a conventional swept-wing, all-weather aircraft. Few details are known other than the fact that the design has two large underslung jet nacelles and a "thimble-type" nose radome.

Roughly in the same performance bracket, but of different aerodynamic form, is the *MiG-15F*, the first Soviet 2-seat, all-weather jet to be brought into service.

Longer fuselage to accommodate the 2-man crew, rounded instead of angular wingtips, a bullet-shaped *A.1.* scanner nose-fairing, and a modified tail unit are the major changes from the basic single-seat *MiG-15*, known as the *Mik-19*.

In a class similar to the McDonnell *F2H-2 Banshee*, this 650 mile an hour fighter has two axial turbojets mounted side-by-side on a triangular section fuselage.

In the *Yak-21* and *Mik-23*, single-seat fighter designs, the Soviet Union has put into practice some of the theories investigated by German designers of World War II. Primarily a strategic defender, the *Yak-21* greatly resembles the *Me-163*. Powered by an advanced type of rocket motor, it is conceivable that this diminutive aircraft might be used as a practice fighter carried under the fuselage or wings of a *Tu-200*.

In the summer of 1951, a machine with sharply swept wings and high-mounted tailplane appeared in the sky over Germany. Thought to be the *Mik-23*, it incorporated many of the features of the German, Kurt Tank's *Ta-183*.

The majority of day interceptor units

of the Soviet Air Force are equipped with the infamous *MiG-15*. First gaining notoriety in Korea, its astonishing rate of climb and high maximum speed gave United Nations pilots many a headache until the *F-86 Sabre Jet* was introduced.

Several *MiG-15s* have fallen into our hands but, in spite of extensive flight trials at Okinawa and Wright Patterson Air Force Base, official performance figures have not yet been released. Lack of equipment, insufficient stall warning, poor heating, and a badly ventilated, cramped cockpit were a few of the criticisms leveled at the *MiG* by American test pilots.

Less well known than the *MiG-15*, but of similar general lines, is the *La-17*.

This shoulder-wing airplane has three degrees greater wing sweep-back than the *MiG*, and is similarly powered by a 5,953-pound static thrust *Wk-1* turbojet. Other differences include a longer fuselage and lengthy ventral under the tail. Not in large-scale production, the *La-17* has been employed as a long-range escort fighter. Recently, a development of the *La-17* for ground-attack duties has been introduced.

Two "cheek" air ducts now replace the former nose intake with a heavy caliber gun in the nose.

Transports and Gliders

Ilyushin *Il-12s* and Lisitsin *Li-2s* would form the backbone of the Soviet Union's medium-range troop transport armada if any great offensive was planned by that nation.

The *Il-12* is an up-to-date twin-engine wing monoplane bearing a superficial resemblance to the *Convairliner 240*. Since its introduction in 1946, many modifications have been made to increase its usefulness. Redesign of several components has been undertaken at one time or another, and variants can be seen flying with or without the dorsal fin. Up to 40 troops can be carried. Glider towing is among the list of duties carried out by the *Il-12*. Two types of gliders are known to

have been operated by the Soviet Air Force. One is designed by little publicized P. B. Tsibin, while the other is the brainchild of fighter expert Aleksandr S. Yakovlev. Both are conventional high-wing monoplanes.

Many Douglas C-47s are in service in the Soviet Union bearing the designation *Li-2*. Rendered obsolete with the appearance of the *Il-12*, most have been diverted to use with Soviet internal air lines.

The *Tu-70* shares with the *Tu-4* the responsibility of conveying airborne troops on long-range operations where glider towing would be impracticable. With its 120-foot long fuselage, compared with the 99-foot length of the paratroop *Tu-4*, the *Tu-70* is able to carry 110 troops at speeds up to 300 miles an hour. A "step-down" cockpit and lower wing mounting contrast with the smoother lines of 32-seat bomber adaptations.

In Retrospect

From our survey, it is clear that Soviet designers are just as far ahead in aeronautical developments as those in the West. Explosion of the first atom bomb inside the Soviet Union gave the impetus needed to speed up development of her strategic long-range bomber fleet.

Of the 25,000 combat aircraft in the Soviet Union, a very large percentage are the latest type of jets. Now unconfirmed reports are coming through that the Soviet Union is testing various types of delta aircraft including a vertical take-off fighter and a long-range atomic-powered bomber.

Nor have guided missiles and rocket research been neglected. Powerful weapons in the V-2 class are able to carry an atomic warhead.

The most reassuring fact of the over-all picture is that United Nations technicians are working along parallel lines.

Soviet Artillery

Digested by the MILITARY REVIEW from an article by Major I. R. L. Shaw in "The Journal of the Royal Artillery" (Great Britain) April 1954.

THE Soviets are very proud of their artillery and often refer to it as the "Queen of Battle" or "God of War."

This article is not intended as a reference as security and space available preclude that, so detailed organizational and technical facts have been excluded deliberately. The aim of the article is to provide a general interest background for those officers who know little or nothing of the important subject, Soviet artillery.

Soviet Organization—General

Every Soviet formation from the regiment upward has its own organic supporting, reconnaissance, and administrative units. Yet, at army level and above, their reserves of supporting arms are formidable,

particularly in respect to artillery and, to a lesser extent, of armor. They are, therefore, partially grouped by virtue of their organization, and have strong reserves at the higher levels.

This "partial grouping by virtue of their organization" is carried a step further because they have three, not two, types of basic "line" divisions. Their rifle division is similar to our infantry division, and their tank division is similar to our armored division, but in their mechanized divisions they have a new—and as yet—untried formation. One can roughly compare a mechanized division to an infantry division with an additional armored regiment, and sufficient organic transportation, so that no man in the di-

vision is required to march; an interesting and potentially formidable formation.

Soviet armies are of two types, rifle and mechanized. The former has rifle corps, which include a mechanized division and are "tactical" as opposed to self-administering formations. Mechanized armies have no corps, and contain tank and mechanized divisions in equal proportions.

The Soviet "army group" is called a "front," and may contain rifle and mechanized armies, as well as an attached air army and large reserves of artillery. Above that level, they do not have, for instance, Theater General Headquarters. The practice in the last war was to send command co-ordinating teams from Moscow whenever large-scale operations were to be conducted.

In general, Soviet units and formations are considerably smaller in manpower—not in fire power—than their British counterparts. This is achieved by a severe pruning of administrative units and some supporting units (engineer and signal corps). They also exist with fewer vehicles than we do. This gain in "teeth to tail" ratio is obviously desirable, from their point of view, but one wonders if they have not overdone it. As their army has only been motorized on a Western scale since the end of the war, they have yet to experience the handling of fully motorized armies in war.

Self-Propelled Weapons

Strictly speaking, these Soviet fully armored, self-propelled, tracked assault guns (*SUs*) are not artillery but armor, manned by armored personnel. They are, however, complementary to both, and it is important to understand what they are and to know their potential.

There are three types of *SUs*: light, medium, and heavy. The light *SU* is found in rifle regiments and is the only *SU* that can be compared in any way to our 25-pound *Sexton*. The medium *SU* is mounted

in the medium tank chassis and has their best antitank gun in it, and the heavy *SU* is based on the heavy tank chassis and mounts their medium gun-howitzer. Heavy *SUs* are found supporting medium tanks, while medium *SUs* support heavy tanks, with one exception: in the rifle division, medium *SUs* are included in the medium tank regiment.

The main task of medium and heavy *SUs* is close support of tanks; their second task is close support of infantry supported by those tanks. Almost invariably, fire is "direct fire," often from ranges in excess of normal tank gun ranges. The proportion of tanks to *SUs* is generally two or three tank units or subunits to one of *SUs*; together with an infantry element (except in the rifle division) these will form an armored regiment (there are several types of armored regiments). *SUs* in attack usually operate one bound behind the tanks, and fire from stationary positions, while their tanks often fire on the move. The infantry waves either just precede or just follow the tanks, according to the opposition expected; against lighter opposition, tanks usually lead.

When tanks get into difficulties, they often retire through their supporting *SUs*, and in defense there are several tasks allotted to *SUs*; these may include support for counterattacks and antitank work in depth. *SUs* are sometimes dug-in well forward to form strong points complementary to infantry outposts.

The Soviet Army, not unnaturally, has been more influenced by the German Army than any other. There was a close liaison between the wars, until the Spanish Civil War and the purges of 1937. *SUs* are a German conception, and were further developed from bitter combat experience with German armor between 1941 and 1945.

Clearly, *SUs* are useful weapons; their advantages and disadvantages are summarized as follows. There is presumably some economy in production, because they

do not have tank-type turrets; they have low silhouettes and the mobility of tanks; they bring medium gun-howitzer and anti-tank support right up with their tanks; Soviet troops like to see what they are firing at—they are exponents of direct fire. The disadvantages include limited traverse and depression, and presumably some extra administrative problems.

Artillery Organization

At front level there are formidable artillery reserves in the form of "breakthrough" artillery divisions, gun artillery divisions, antiaircraft artillery divisions, and antitank regiments (towed antitank guns are the basis of Soviet antitank defense, *SUs* being a useful bonus). At army level, again, there are reserves in the form of an organic artillery brigade, antitank regiment (rifle army only), and antiaircraft divisions. Rifle corps also have organic corps artillery.

Breakthrough artillery divisions include field, medium, and heavy howitzers, heavy rocket launchers, and heavy mortars; their title explains their role. The role of gun artillery divisions is evidently mainly counterbattery. Antiaircraft "divisions" are, in fact, smaller than our Army Groups, Royal Artillery (antiaircraft).

At first glance, their line division artillery are slightly smaller than ours, but it must be remembered that rifle and mechanized regiments have their own organic artillery elements. Rifle division artillery includes field-antitank guns, field howitzers, heavy mortars, and light antiaircraft guns. Mechanized divisions lose the field-antitank guns and heavy mortars, but gain a battery of medium rocket launchers, a regiment of medium mortars, and some antiaircraft heavy machine guns. Tank division artillery is the same as for mechanized divisions, less a battery of field howitzers. Survey troops perform the duties of locating hostile guns and mortars,

as well as survey. Small artillery workshops are also organic to line divisions.

Regimental artillery differs between types of regiments. In general, it includes medium mortars, field-antitank guns (light *SUs* in rifle regiments), light antitank guns, and antiaircraft heavy machine guns.

Although not "artillery," manned by gunners, it would be appropriate to mention that rifle battalions include a few light antitank guns in their support elements, and also infantry mortars, antiaircraft heavy machine guns, "antitank projectors" and considerably more medium machine guns than we do. This increase in machine guns compensates, to some extent, for the fact that rifle battalions have only three rifle companies.

Artillery is responsible for its own ammunition supply and for the supply of most types of ammunition to other arms. We would recognize our gunner opposite numbers from the fact that they wear crossed gun barrels on their "shoulderboards" (epaulets which indicate rank and arm).

Artillery Equipment

All Soviet equipment, artillery and otherwise, are robust, simple, effective, and shorn of unessential refinements. Their artillery pieces are invariably dual purpose, one being antitank. All field guns are called field-antitank, some having antitank as the primary role and others as the secondary role. This is not "lip-service" to a theoretical ideal; it is a fact. They have only one gun-howitzer (medium), otherwise "guns" are either gun or howitzer. Their field guns throw a shell lighter than ours, farther than ours, and, on comparing mortars, it would appear that they definitely out-mortar us.

The Soviets' special contribution to artillery is rocket launchers. These sinister weapons are mounted on rails on the back of a standard truck, and are fired electrically from the cab. They are very un-

pleasant "area weapons," and difficult to combat.

They have air observation posts, observation balloons, and equivalents of most of our "higher techniques," but they are inclined to lag in technical matters. Their radio sets and nets are adequate, if fewer than ours, and their line communications are excellent. Prime movers for heavier equipment are tracked tractors; standard range vehicles are used to tow lighter equipment. Soviet artillerymen are sturdy manhandlers, particularly of mortars.

Tactics—General

Undoubtedly tactics are dictated largely by commonsense and the usual factors of strengths, ground, and commander's personality. There are, in addition, "national characteristics," and the Soviets' are summarized below.

The first tenet of Soviet training and organization is close co-operation between infantry and armor; the second is probably to organize antitank defenses and reserves at all levels. They like to see what they are up against, and their reconnaissance and observation post work of all types is of a high standard. There is a tendency for senior commanders to get well forward and "breathe down the necks of their subordinates." They believe in massing troops and equipment in the vital sector, often by denuding reserves and other sectors, and they expect and accept casualties.

Their defensive layouts are more linear than ours, but they also obtain great depth by having a series of zones, with lines and centers of resistance (particularly antitank and counterattack) within, and sometimes between, zones. Their liking for linear defense is explained by the fact that they aim to deploy the maximum number of automatic weapons to cover the approaches to their positions. They make good, if unimaginative, use of mines.

Advances are usually led by considerable numbers of "reconnaissance troops"

(including motorcycle combinations), with engineers and light artillery elements under command of the vanguard and advance guard. When first halted, a very determined effort to continue the advance can be expected from the advance guard formation. (The members of the Soviet Army are past masters at improvisation, particularly in crossing obstacles.) If they are still held, a lull can be expected, and they may settle down to a cumbersome and thorough "set-piece" assault, preceded by careful reconnaissance. When this comes, it will be well planned in every detail, but somewhat inflexible. Artillery preparations will be closely followed by several waves of armor and infantry. Soviet deception plans in the past have included "feint attacks," "holding attacks," and "decoys" (one or more tanks have been sent to probe a position with the object of getting the enemy to disclose their defensive fire). Perhaps their greatest weaknesses are in meeting the unforeseen and in exploitation.

Handling of Field Artillery

Soviet artillerymen are capable of performing nearly every technique that we are, and they often do. It is true, however, to say that in practice they are more "bow and arrow" than the British, and less flexible. They like to see what they are firing at, and very often employ direct fire, sometimes even of the heavier calibers.

Mortars are widely used, and well handled. As often the technique is to "up and out" after firing, they will be difficult to counter which leads to the handling of rocket launchers. Several firing positions are reconnoitered, and the calculations and loading, which take some time, are done in the rear out of harm's way. The launchers are then driven onto the firing position, fired and withdrawn for reloading. They are likely to reappear at a different site about half an hour later. Rocket launchers are not very accurate, but, as

has been said, they are formidable "area weapons" with a high "morale value."

In the last war, the Soviets had, overall, up to one gun or mortar, for each five infantrymen, and for important assaults, they aimed to deploy 250 guns and mortars every 3,000 feet. In both defense and attack, considerable numbers of antitank guns were deployed well forward in the direct-fire role; in attack, these guns were used both for the preparatory phase and for support of the initial assault.

Regimental deployment and communications in all phases are not unlike our own. For observed fire, the observation post officer does more of the calculations than we do (now that target grid has been adopted). Gun positions are often "linear," to simplify calculations, with guns about 100 feet apart. They can and do survey properly, particularly for "set-piece" battles, but quite frequently guns are "put on" by the gun position officer's compass—line being passed from the dial sight of the selected gun.

The Red Army—as it was then called—made good use of sound and flash locating in the last war. They know about meteor, air-burst ranging, and are particularly keen on "witness point" fire. That is, they range on a point off the target, and switch to the target for fire for effect.

Their fire plans for a big battle are comprehensive. "Artillery groups" are formed at most levels; these are organized by allocating reserves of artillery "one, or more, down." Organic artillery remains in direct support, while the allocated artillery concentrates on the planned fire program, including the fire of the organic artillery in the opening phases. "Mortar groups" are often formed for the initial phases by pooling organic mortars "one up."

Fire plans in support of an assault are divided into three main phases: preparatory, support of the initial assault, and support of the attack as it progresses.

The preparatory phase is usually very thorough, and aims at destroying selected strong points that have been located during preliminary reconnaissance, and neutralizing all remaining positions that cover the axis. There were, however, occasions during the last war when, for the sake of surprise, the preparatory phase was omitted. Usually, support for the initial attack is also very thorough, combinations of barrages and time concentrations being employed. Fire plans go into some detail for the later stages of the attack, but here, one hopes, their inflexibility in the orthodox (Western) handling of artillery starts to take its toll. However, the Soviets are aware of this shortcoming, and it is partially compensated for by the presence forward of *SUs*. Field-antitank reserves are hurried forward as soon as ground has been gained, so these, too, compensate for any shortcomings in the preplanned indirect fire support. Counterbombardment, possibly from medium and heavy guns of a gun artillery division, will undoubtedly be included in some or all of the phases, and the Air Army (under command at front level) will certainly play a big part in ground operations.

In defense, the Soviets employ standing and moving barrages. The latter are preplanned down likely tank approaches, with a view to separating enemy tanks from their infantry. Otherwise (and always bearing in mind their increased use of direct fire) their ideas on defensive fire are similar to ours.

"Artillery advisors-representatives" are much the same as in the British Army, and have much the same responsibilities. Although they have the machinery to lay on "Mike" and "Uncle" targets, there is no drill as such for them. If an observation post officer wants more guns, he can ask for them on the radio and may eventually get them. In general, therefore, the Soviets employ many guns on many tar-

gets, rather than switching the fire of groups and regiments.

Antiaircraft

In the antiaircraft field, the Soviets have adequate light, medium, and heavy guns, as well as the ubiquitous antiaircraft heavy machine guns. They operate early warning radar, tactical radar (occasionally), and fire control radar; and they possess predictors, identification friend or foe (IFF), and some electrically controlled guns. During the war, they received various British and American equipment; some of which they still use, and others which they have developed. However, it is true to say that they lag technically, unless, as is the Soviet practice, they have some "surprises tucked away" which would be issued when available in large numbers, or kept for a propitious moment.

The antiaircraft defense of the Soviet Union is organized in zones and "rings" within zones, not unlike that of Great Britain, except that fighters and guns are fully integrated in Soviet home defense formations.

In the field army, medium antiaircraft guns (from antiaircraft divisions) are sometimes allotted to lower formations almost in "penny-packets," and on occasions may appear well forward, particularly in defense of armored concentrations.

The handling of light antiaircraft guns is normal, but it should be remembered that heavy antiaircraft machine guns occur at almost every level down to rifle battalions, and on individual heavy armored fighting vehicles.

The Soldiers' Lot

The soldiers' lot is not "happy" by Western standards, but, after 36 years of Communist rule and centuries of privation, they do not really expect or know any better.

Directly or indirectly the Party controls everything. In a subunit, the "Party

line" is put across by the Deputy Commander for Political Affairs (relic of Political Commissar, shorn of a lot of his powers). He also serves as a welfare officer. Informers exist at the rate of about 1 man in 10. They report to the next in the counterintelligence chain, and not to either the Political Deputy or the normal commander. Counterintelligence (counter-revolutionary) staffs occur down to Regimental level. They and their "set-up" are feared and hated. No one, irrespective of his position, feels quite safe, and it is an unwise man who expresses any opinions outside the accepted ones, even to his "best friend."

Appreciable numbers of servicemen belong to the Party or to the *Komsomols* (Young Communists). They are controlled by what are known as "Party Organizations," which exist at all levels from company upward. (Party Organizations, Deputy Commanders for Political Affairs, and Counterintelligence are three separate organizations, but they are, of course, closely related and often work together. Between them they ensure Party control.) Men are encouraged to join the Party, but are not forced, nor are they accepted without considerable preliminaries (one of the enigmas of communism is how anyone can possibly stomach the mass of dreary paper that has to be read and learned).

Discipline is rigorous; even officers find their way into the guardroom often enough. Enlisted men's food and amenities, leave, clothing, and pay are all poor by our standards.

Conscription is nominally for 2 years, but a man is lucky to get out in under 3, especially if he becomes a noncommissioned officer or specialist. Some other ranks, relatively few, extend their conscripted service and become senior noncommissioned officers with increased pay and privileges. Women's services exist similar to our Women's Royal Army Corps and are "integrated," rather than forming separate

units. They receive "semiofficer" privileges and pay, and are held in low esteem by their male comrades.

Training establishments and schools exist on scales similar to our own. Conscripts go through much the same process as ours do. There is a voluntary organization for giving youths some preliminary military training, which is a useful adjunct to the "military machine." *Suvorov* schools give boys a good secondary education, the curriculum including military subjects. These schools provide a valuable source of officer and noncommissioned officer candidates, although graduates are not actually forced to join the services.

The "average Russian" is moody, sentimental, patient in many ways yet quick to lose his temper, impressed by a show of strength, stubborn in defense, dogged in attack, good at fieldcraft, a fair technician once he has mastered a subject, generous, and fond of children. On contact with the West, even Eastern Germany, he is quick to notice how much better off are his opposite numbers.

Conclusion

All but the most rabid Communists are disillusioned about the regime, but by now a very major upheaval would be required to oust it. This is unlikely to come from within the country. No matter how much a Russian may hate his rulers and the system, he invariably continues to "love Mother Russia."

It is probably true to say that the Soviets do not compare with the Germans as soldiers (or artillerymen), and that they

are not as tough or fanatical as the Japanese could be. But they have a formidable artillery, and their special pride in it is not misplaced.

On the one hand, there is no point in being unduly depressed by the apparent weight of Soviet artillery; while on the other, it would clearly be dangerous not to appreciate their worth. The following few "dos" and "don'ts" may be useful, should we ever have to fight a war against the Soviet Union:

1. Give particular thought and priority to combating rocket launchers, *SUs*, mortars, and guns used in a direct fire role.
2. Insist on good "observation post drills," because their observation is first class and they look for observation posts. Conversely, look for theirs, because they place even greater reliance than we do on what they can see.
3. Be on the look out for "feints," "decoys," and "traps" (tanks retiring through a screen of *SUs*, or defensive barrages in the best approaches).
4. Decide what is the largest artillery subunit (or unit) that we can afford to lose to enemy air or counterbombardment, and organize good local defense at that level (this sounds "cold-blooded," but it will save lives in the long run).
5. Aim to separate their tank-infantry-*SU* assault teams.
6. Exploit their inflexibility, particularly in the later phases of a "set-piece" battle.
7. Take every advantage offered by our superior skills and equipment to combat numerical "brute force."

The Soviet Union has the most powerful mobilized ground forces on earth, great and growing air strength, and an impressive submarine fleet. In view of this potent military threat, I feel we are following the only logical course. We are endeavoring to make ourselves and our allies so strong that the enemy will decide it would be fatal to his own interests to plunge the world into war or to risk the consequences of creeping aggression.

Secretary of the Army Robert T. Stevens

Role of Research and Development in War Preparedness

Digested by the MILITARY REVIEW from an article by Wing Commander U. K. Nair in the "Indian Air Force Quarterly" April 1954.

THE strategy and tactics of warfare revolve around weapons. A study of their evolution shows that they appear as the result of past scientific discoveries rather than as products of organized science. It was only in World War II that science was organized on a comprehensive scale for the research and development of weapons which played such a decisive part in the winning of victory.

Aside from research in explosives, it is not known precisely when science began to be organized for war. In the United Kingdom, the organization of science dates from the formation of the Royal Society about 300 years ago.

Although the Society was not formed for the purposes of war, there are records of its members having been engaged in the design of ships. But the practical sailor of the day thought that he knew all about sailing and the design of ships and resented the idea of any outsider improving on his experience. Hence, the Society was seldom consulted.

But when the sailor was confronted with something mysterious beyond the scope of his practical experience, like position finding at sea, he turned as a last resort to science. The Hydrographic Office was formed in 1795. This was the first scientific department within the services. Since its inception, it has steadily enhanced its reputation although navigating officers were looked down upon in the Navy for many years.

The development of steam power in the nineteenth century brought about the Industrial Revolution and raised war from the "cockpit of gladiatorial armies to the grand amphitheater of contending nations."

The first power-driven flight was

achieved in 1903 with the aid of an internal combustion engine. This engine, together with the endless chain track, revolutionized road transportation and consequently, land warfare. By solving the problem of flight, it raised war into the third dimension.

Later, the invention of wireless transmission of energy annihilated time and space and spread war into the fourth dimension.

But despite the startling scientific discoveries of this age, there was little organized research to meet the needs of the services, although steps were taken to improve the standard of their equipment. The appointment of the Advisory Committee for Aeronautics in 1909 was such an organization. The Committee was to engage in the design of aircraft; its terms of reference did not include the use of the airplane in war. No one had seriously thought of the possibilities of bombing, methods of navigation, or antiaircraft defenses.

World War I

The Germans, on the other hand, had, from the beginning of the twentieth century, realized the vital national importance of research and development. Consequently, they were able to surprise the allies with new weapons and tactics in World War I. An example of this was the famed *Fokker Scout* airplane which had interrupter gear fitted onto its guns. This machine revolutionized air warfare.

The allied technical deficiencies in the air were so discouraging that the War Office was forced to study air tactics by scientific methods. The Orfordness experimental station for the investigation of gunnery, bombing, and navigation, and Martlesham Heath, for the testing of air-

planes, were both founded for this purpose.

The other two services also had to contend with the new weapons and tactics of the enemy. The German submarine warfare was one of them. Scientific means to locate a submerged submarine were only sought by the Navy when the submarine menace became acute. It was then too late and the submarine menace was eventually brought under control by the convoy system.

The Army successfully copied and improved upon the weapons and tactics of the enemy. The outstanding exception was the development of the tank.

The main lessons of the war were taken to heart. The Government of the United Kingdom introduced scientific research into industry and the universities. The Admiralty, at last convinced of its importance, established its department of scientific research on a permanent footing and put a scientist in charge. The Air Force and the Army did not do so until 1924 and 1938 respectively, although they continued to develop their research establishments under the direction of service officers. Thus, the greatest lesson of the war was not learned, "That it was not enough to look to science in an emergency to supply the wants of the services; scientists must also study the needs." The first time that scientists were ever called in to study the needs of the services was in 1935, and then only as a last resort to meet the Nazi menace.

The Tizard Committee was appointed in 1935 to carry out a scientific survey of Great Britain's air defenses. The situation was grave and the public was longing for death rays that would destroy the strongest enemy at will.

Doctor Wimperis—then the Director of Scientific Research at the Air Ministry—secretly consulted Doctor Watson Watt, the Superintendent of the Radio Department of the National Physical Laboratory. Within a short time, Watson Watt pro-

duced a note containing an estimate of the possible damaging effects of a ray consisting of radio waves. It was shown that the quantity of energy needed to upset an aero-engine or to injure a person could not be produced by any known method; but the quantity of energy needed to detect the presence of an airplane or ship could reasonably be produced by an extension of known means.

Development of Radar

The views of Watson Watt were put before the Tizard Committee at its first meeting in January 1935, and were approved. The National Physical Laboratory provided him with the nucleus of a research team. He rapidly produced a plan based on the radio echo method and successfully demonstrated how to find the distance, the bearing, and height of aircraft over a front of up to 100 miles.

In March 1935, the Tizard Committee recommended large-scale experiments on the new invention which has since been given the comprehensive name of radar. The Treasury sanctioned the necessary funds. A laboratory was constructed at Bawdsey Manor. Watson Watt and his team worked here on the design of the required equipment to produce and record the radio echoes visually.

A subcommittee of the Committee of Imperial Defense was also formed with representatives from the three services and the radio industry.

Development of Fighter Tactics

While the system of radio location was being developed at Bawdsey Manor, the development of fighter tactics for use with radar was begun at Biggin Hill and the fighter pilots were trained in their use long before radar itself was developed. Aircraft were fitted with radio responders to simulate radar echoes. These were picked up by direction-finding apparatus and helped in working out interception

tactics. It was this farsighted development of tactics which enabled the Royal Air Force (RAF) to efficiently utilize the advantage given to them by radar in the Battle of Britain.

The first air exercise in which radar was used was held in September 1938. The results were so encouraging that it was decided to erect a chain of stations—on the pattern of Bawdsey—to cover the east coast of Great Britain. Thus, in 1939, the east coast of Great Britain was covered with invisible radio waves. Aircraft approaching at 15,000 feet were detected by them more than 100 miles away through night, cloud, and rain. Their numbers could be counted and their evolutions watched. This was achieved with the aid of scientific research and the expenditure of 28 million dollars.

In the Battle of Britain, the Luftwaffe had a definite numerical superiority over the RAF. But radar—by giving early warning—eliminated the necessity for standing fighter patrols. This enabled the RAF to concentrate the available fighters at decisive points. The same system warned the civilians to take cover before air raids and also obviated the need for thousands of crews to man the anti-aircraft guns.

Frustrated by day, the Germans began attacks in the night. The early warning sets were not good by night as they could only guide the fighters within 3 miles of the raiders and, thereafter, interception had to take place visually. Scientists and military officers worked on this problem and developed the Air Interception (AI) and the Ground Controlled Interception (GCI) sets which won the night battles.

Such successful teamwork spread rapidly throughout the services and on the staffs of all major commands, scientists began studying plans for the future and analyzing the results of past operations. It was as a result of such studies that radar navigational aids like the *Gee*, the

Oboe, and *H2S* were developed. With these aids, the 1,000 bomber raids into Germany and the Normandy landings became possible. *H2S* fitted to coastal command aircraft brought the submarine menace under control and contributed toward victory in the Battle of the Atlantic.

Radar in Other Spheres

Radar revolutionized naval tactics. It detected the presence of enemy ships far beyond the horizon through darkness and fog. It raised naval gunnery to a new level of accuracy. Fire could be opened at greater ranges and against unseen targets.

Radar equipment was also devised for anti-aircraft guns. In anti-aircraft gunnery, the main radar triumph must go to the American scientists. They produced an admirable radar gun laying equipment which followed the target automatically. With these—and other American equipment like the *V-T* or self-acting radio fuze—the German flying bomb attacks were defeated.

The crowning discovery of defense science during the last war was the atom bomb.

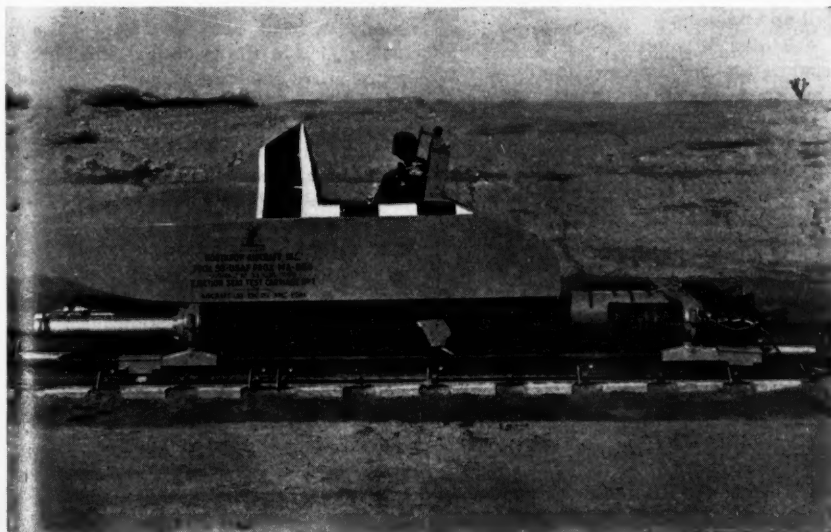
German Scientific Defeat

Although many brilliant scientists were lost to Germany because of persecution and banishment before the war, Germany did not lack scientific talent or industrial resources in the field of radar. In fact, German scientists and engineers had greater prestige than their British counterparts. Their efforts—although brilliant in individual fields—were never co-ordinated by the rulers of Germany. Examples of this lack of co-ordination are many.

The German scientists put much work into developing a noncontact pistol for the war head of a torpedo which was worked by the shadow cast by a ship. German naval authorities never told these scientists that the torpedo is primarily a weapon for use at night and, therefore,



It is not enough to look to science in an emergency to supply the wants of the services. Scientists must also study the needs in order to meet the complex demands of modern warfare. Some program results are the United States Army's 280-mm atomic gun, above, and the high speed carriage for testing ejection seats for jet planes, below.



a shadow operated pistol would be of little value. The same was true of the snorkel, a device when fitted to a "U" boat enabled it to run its engines even when submerged. It could have been developed early and used with devastating effect in the Battle of the Atlantic if there had been effective collaboration between the German scientists and the Navy.

Beside lack of co-ordination, the German General Staff believed, in 1940, that they had won the war. They, therefore, stopped all research and development which was not of immediate military value. When they realized their mistake in 1942, it was too late, as the British had already gained a lead of several years.

Cost

The world expenditure on armaments was approximately 168 billion dollars in 1952. Of this, about one-third was spent on research and development in advanced countries like Great Britain and America. It is estimated that about 1 percent of the total national income of these countries is spent on research and development, both civil and military.

A permanent research and development organization has emerged in the United Kingdom as a result of the last war. There are over 6,000 scientists working today in this organization. They all belong to a unified scientific service. Each service has its own laboratories and scientific advisors—under whose direction research and development of weapons is carried out. This work is essentially applied research.

The staffs of all major commands also include scientists whose function is the development of tactics or combined use of weapons. This is of the operational-research type.

The three separate service establishments work in close collaboration not only among themselves but also with industry.

A study of recent military history shows the importance of developing tactics with

special reference to the civil progress in the area of operations. The tank is a weapon of World War I. The development of blitzkrieg tactics with it enabled the Germans initially to overrun Europe. Their failure to adapt these tactics to suit the Soviet terrain, coupled with the partisan tactics of the Soviets, spelled disaster to the German forces in the Soviet Union. It was because the allied armies were road bound and the Japanese used the horse, the elephant, and the handcart—and generally adapted themselves to the terrain in Burma and elsewhere—that caused the failure of the former and the success of the latter in the early stages of the Far Eastern Campaign. The history of tactics and their close association with the civil progress in the area of operations repeated itself on a larger scale in Korea recently.

Conclusion

We are acutely conscious of our dependence on foreign countries for gasoline, airplanes, tanks, guns, and other essential military supplies. We have, no doubt, begun to develop our own resources and industries. But these would take time to bear fruit. In the meantime, if an emergency arises and we are unable to get supplies from abroad, we have to fall back on our available resources. Is the Defense Science Organization considering tactics under such circumstances? The horse, the camel, the elephant, the bullock cart, and the country boat on our rivers and seas may become suddenly important to us. I am not for a moment suggesting a return to the jungle, but only advocating a realistic approach for the period which must elapse before we become a self-sufficient power. The art of tactics with these ancient weapons of war must be kept alive during the period of transition.

The role of research and development in war preparedness, therefore, is to develop new weapons, improve existing weapons, and develop tactics.

In order to successfully play its role, an organization is essential in which the deviser, the user, and the producer of weapons work in close collaboration. Such an organization was evolved for the first time in the United Kingdom in World War II. It was this integration of scientific and military thoughts which made for allied success in the last war and the absence of such an integration which made for the German scientific defeat.

Above all, the research and development organization must consider the nature of the "constant tactical factor" and develop tactics to suit the new weapons or the con-

ditions in the area of operations. After all, a weapon is not an end in itself but only a means to an end.

The development of new weapons would be beyond our capacity for some time to come. But we can and must develop the right organization and tactics. The right organization would come into being if the present gap in the Defense Science Organization is filled by setting up a Directorate of Technical Development within the Indian Armed Forces. It would also be advisable to keep alive the tactics with the ancient weapons of war until we become a self-sufficient power.

The Strategic Situation in the Middle East

Translated and digested by the MILITARY REVIEW from an article by A. L. Ratcliffe in "Wehrwissenschaftliche Rundschau" (Germany) February 1954.

THE chain of advanced air and naval bases which mark the security belt which the United States has established around the European-Asiatic bloc of the Communist countries has a wide gap in it between Turkey and Indochina.

In a vast curve, from the Caspian Sea to the South China Sea, the fringe nations of Asia—Iran, Afghanistan, Pakistan, India, and the countries of southeast Asia—form the border of the great Communist powers: the Soviet Union and China.

In contrast with the countries of the Near East which, with the exception of the Republic of Israel, constitute a unified cultural region with a common language—Arabic—and religion—Islamic—the peoples of the Middle East are separated by differences of race, history, speech, and faith. Common to all, however, is the memory of centuries of colonial rule by the Europeans. In the case of all of them, independence has been won only during the last decades and also

common to all of them is the disillusioning discovery that independence alone does not guarantee eternal freedom, but that independence requires a continuous fight for its preservation. Thus, the countries of the Middle East, instead of being able to devote themselves, in peace, to their national development and the consolidation of their domestic situations, find themselves entangled in the maneuverings for control of the great power groups and threatened with the possibility of becoming participants, against their will, in another great war.

Increased Pressure

It is not hard to understand why these peoples have not yet been able to overcome their distrust of their former colonial masters and why they—on this account—have more fear of the intervention of England and the United States in their national affairs than of aggression by Moscow which, to their senses, seems far away. However, sober consideration of the politi-

cal and strategic factors involved can but lead to the conviction that the greater threat to the independence of the Asiatic border states stems from the dynamism of aggressive communism as incorporated in their two northern neighbors. From year to year, the political, economic, and military pressure of the Soviet Union on the Middle East increases. A powerful Soviet army is assembled south of the Caucasus, and even if its garrisons—between the Caspian Sea and the Chinese frontier—appear at first glance to be weak, still the Soviet Union is quietly expanding its strategic railway and highway network along the northern border of Iran and Afghanistan. Soviet agents are working among the Kurds of eastern Turkey, are creating unrest among the nomads of Iraq, are stirring up the border tribes of Afghanistan, and are fanning the fires of discontent among the masses of Iran. Chinese troops are threatening the frontier regions of Pakistan, have infiltrated into Tibet, and are pushing toward the unprotected northern frontiers of Nepal and India. Partisans organize uprisings in Burma and Siam and Communist "volunteers" from China carry on Moscow's war in Tonking and Malaya.

The governments of the threatened countries do little, however, in defense against the Communist danger. None of these states possess an army of sufficient strength to hold out long against a Soviet or Chinese attack. Pacts for the purpose of common defense go to pieces in the face of frontier disputes, tribal antagonisms, and religious differences. The unsatisfactory tracing of boundaries in the division of India especially, has provided the germ for eternal tension between Pakistan and India. Pakistan appropriates 40 percent of her national budget for protection against India, while India expends 70 percent of her national income in preparation for the clash with Pakistan over the Kashmir region. The situation is about

the same in the remainder of the states of southeast Asia.

The Middle East constitutes, therefore, a military and political vacuum whose suction effect increases as the strategic importance of this region grows from year to year.

Iran

Of all the countries of the Middle East, Iran—the classical gateway between Europe and India—is the most directly exposed to Soviet pressure.

Soviet aspirations for access to the Persian Gulf are long standing. They have recently been revived, on the one hand, because of the attraction of Iranian oil; and on the other out of purely strategic considerations. The less the prospects become for a Soviet breakthrough through Asia Minor, through the Straits, or through Thrace to the Mediterranean, because of the strengthening of Turkish armed forces, the greater become the prospects of a drive through Iran into the Arabian states in order to threaten the south flank of NATO, to cut off the West from Arabian oil, and to neutralize its sea and air communications with India and the Far East in the event of war. The Iranian combat forces which, in spite of United States aid, possess little capacity for resistance, would be incapable of slowing down to any appreciable extent a surprise Soviet attack. In spite of very considerable terrain difficulties, mobile Soviet forces would be able to reach Baghdad and the Persian Gulf within 3 days.

There are many indications that the Soviet Union has been preparing a political and military invasion of Iran for a long time. During the administration of Mohammed Mossadegh, Soviet propaganda succeeded, by making use of the unpopularity of England in Iran, in ousting the opponents of the Soviet Union from that country. In the northern Iranian province of Azerbaijan (Tabriz), which borders on

the Soviet republic of the same name, a movement has developed with the aim of annexation with the Soviet Union, and in the Tudeh Party which poses under a nationalistic front but is really Communist inspired, the cadres have already been formed for permitting Iran—with its oil production—to disappear behind the Iron Curtain by means of a *coup d'état*, when the proper opportunity arrives. This development appears, however, to have been all but interrupted by the fall of the Iranian dictator. However, the machinations of the Soviet Union continue in this land already badly shaken by the unrest of social revolution. It is a very dangerous gamble with world peace for, in the face of the significance of this area, a repetition of the Korean *coup* would probably touch off a general war.

From this point of view, the strategic significance of the Turkish mountain citadel in eastern Anatolia—from which the elite divisions of the Turkish Army can flank any Soviet attack on Iran—becomes obvious. On the other hand, the decisive significance of the Suez base, which has been the object of such bitter dispute, is emphasized. It would not serve for the direct protection of this marine shipping lane, but would be the assembly area and the supply base for all operations in the Near or Middle East. The retention of this position, therefore, is in no way a matter of British prestige, but a strategically decisive prerequisite for the defense of Europe as well as of Asia.

From concern relative to the developments in the Middle East stem, also, the American efforts toward an adjustment of the Anglo-Iranian oil conflict. At the present time, they have led to the resumption of diplomatic relations between the two countries. The Zahedi Government is markedly anti-Communist, yet is desirous of maintaining the independence of its country.

The strategic significance of the moun-

tainous country of Afghanistan—which is poor from the standpoint of industrial and agricultural production, poorly developed, and lacking in communications—is based principally on the fact that in the event of Soviet aggression against India, it would constitute an operational forefield. The region possesses scarcely any military value within itself.

The present Afghanistan Government is very skillful in the exploitation of the political and economic possibilities resulting from the country's geopolitical situation between the Soviet Union, Iran, Pakistan, and India. It maintains cautious, "good-neighbor" relations with the Soviet Union but, without question, is determined to defend its independence. Its most powerful ally is its extremely rugged terrain.

For more than 100 years, Afghanistan was the buffer zone between Russia and British India. Since England has withdrawn from India, it will depend upon the political skill, acuity, and strength of the government in Karachi and Delhi, and last, but not least, on the combat ability of the armed forces of Pakistan whether the ancient caravan routes through the Khyber Pass—which witnessed centuries of border warfare and over which the armies of Alexander, Tamerlane, and Genghis Khan broke into the plains of India—will become the approach route of Soviet divisions.

Pakistan

Pakistan, with a population of 80 million, the fifth largest state on the globe and the greatest country of the Mohammedan world, in contrast with India, has never given any occasion to doubt that she feels herself to be on the side of the West in the cold war. This is the more significant—both politically and strategically—since it can be seen that Pakistan is making the effort to become—in addition to being the most populous of the Mohammedan lands—also the leading power

of all the Islamic countries of Asia and Africa. Her political situation at home is becoming more and more consolidated. Her agricultural production suffices for the feeding of her population. Her Army is well trained and dependable.

The geographic location of Pakistan ensures her a key position in the defense of the Middle East. The occupation of Pakistan would open the route to India and the coastal routes to the Persian Gulf to the Soviet Union. From the point of view of the West, the division of Pakistan into two parts widely separated from one another by the territory of India, and her quarrel with the latter because of Kashmir, constitute strategic disadvantages. They render difficult the engagement of the concentrated might of this capable nation for containing the Soviet thrust against India, in the event Afghanistan is overrun. The northeast portion of the country is of particular strategic significance. The possession of this region ensures the control of the passes over the northwestern Himalayas and, thereby, over the only militarily practical approaches between the Indian area—on one hand—and Communist China and the Soviet Union, over a narrow strip of the Afghanistan territory—on the other.

Naturally, the United States is making the effort to close this wide gap in her system of military allies. It is also understandable that United States air bases in Pakistan—perhaps in Gilgit near the Soviet-Chinese frontier—would produce a lively reaction on the part of the Soviet Union—which is especially vulnerable in that area. The Government in Karachi sees itself obliged to exercise cautious restraint in its political relations with both the Soviet Union and Nehru's India. However, since it has definitely made its choice of sides, the manner of the inclusion of Pakistan in the infinitely multiform defense system of the free world, can remain a matter for future decision. Moreover, her

membership in the Commonwealth ensures Pakistan, in the event of unprovoked war, valuable friends without entrenching upon her own sovereignty.

India

India—a land of continental magnitude—is not excessively rich in resources. Nevertheless, in the event of an industrial revolution there, following the Soviet pattern, there would be sufficient coal and ore for the creation of an armament industry of great magnitude. Her agricultural production permits no exportation worthy of mention. It does not even begin to suffice for supplying the needs of her own population—which is increasing at the rate of 3 million yearly. It is not, therefore, so much her economic potential that would make the control of India desirable in the event of war, as her land area as such and her enormous human masses which could be of decisive value not only as soldiers but also as manpower for labor for the belligerent who succeeds in using them. In World War II, India mobilized 3 million men without any difficulty at all.

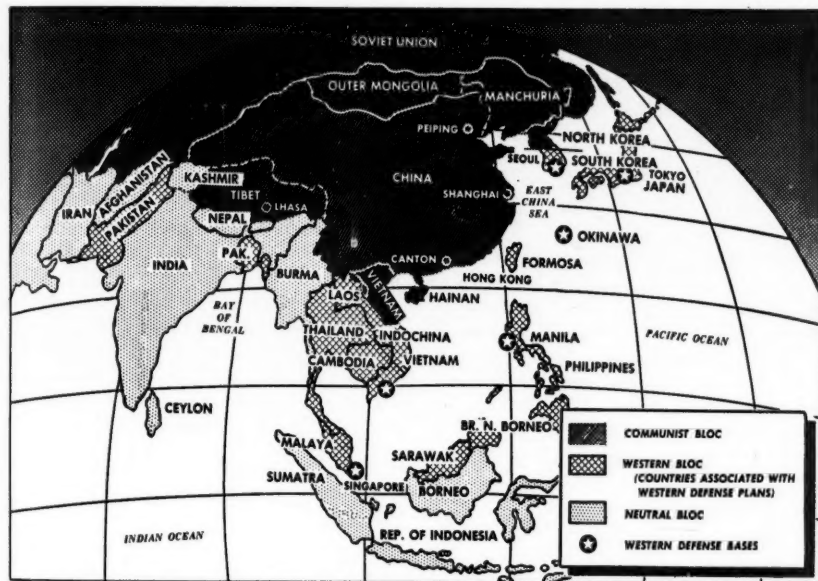
In contrast to Pakistan, the leaders of India are inspired with the vision of making India the leader of a third power group between the East and the West. Today, India is coming to the front in the United Nations as spokesman for the colored race—and not those of Asia alone.

The lack of confidence in the Indian Government—which is suspected of sympathy with Communist China—may be unfounded, but regarded from the point of view of the relationships of powers today and the foreseeable future, India's vacillation in the decision for or against communism, may constitute a real danger for the free world and India's own independence. The attempt to remain neutral in future war would—without any doubt—result in a Soviet invasion—for which the ground is already prepared, owing to India's social conditions, hunger, and over-

population. The extent of the military preparations of the Soviet Union are revealed by the construction of the strategic railway, work which was carried on during the Korean conflict by the western Chinese province of Sinkiang and which is manifestly planned for a potential military assembly on the northern Indian frontier.

Although she had the will to do so, India could not offer any effective military

island of Ceylon—even in the face of the changed political situations—Ceylon, like India, has attained national independence—is available to British war vessels. This base could become important in the protection of the sea routes of the Commonwealth, especially if Soviet submarines appeared in the Indian Ocean. However, operations with more remote objectives in mind could hardly be based in Ceylon.



resistance to a Soviet attack. Her Army which is strong numerically, lacks modern equipment and it is understandable that both England and the United States should hold back on the delivery of weapons as long as India's political course is not clearly recognizable.

An air force is now being established in India. Under Soviet control, India would become a threat to the European communications with the Far East, and could be used as an operational base for attacks against East and South Africa.

The naval base of Trincomalee—on the

Thus, there remains but the hope in the conviction of India's leaders that their country will accomplish its development as the great power of Asia in the framework of the great community of the peoples of the Commonwealth. Any consummation of pacts with communism in misunderstanding of the latter's real nature, would cost India her newly won independence. On the other hand, there can be no doubt that neither southeast Asia, Japan, nor Australia could be held if, after the 450 million Chinese, India's 350 million also became Communists.

Southeast Asia

The countries of southeast Asia constitute the threshold between the Middle and the Far East. In contrast to India, these regions, owing to their agricultural products and the exportation of raw materials of military significance, are, economically, of military importance. Malaya, for example, supplies 70 percent of the world's requirements in tin, and 60 percent of the quinine used. Without the rubber of southeast Asia, the highly industrialized nations would be obliged to depend mainly on synthetic rubber. Millions of workers also could be recruited from the countries of southeast Asia. Southeast Asia is—to a still greater degree than in India—the area which has first place in the strategic evaluation of this enormous expanse of territory.

The largest state of southeast Asia, Burma—in point of surface, larger than any western European country—acquired renown during World War II because of the famous Burma Road. The “back door to China” has retained its strategic significance even to the present time. It could become the advance route of a non-Communist attack operating in southern China, and then, later, the base for overland supply operations.

Burma is no longer in the Commonwealth, although English influence is still dominant there. Burma would be just as incapable of defending herself permanently—without outside aid—if she were to be attacked, as would the other states of southeast Asia—Siam, Malaya, and the countries of the French Union. Under Communist control, Burma could become the base for an attack on India—especially if the Soviet armies did not succeed in opening a way through the passes of Afghanistan and Pakistan.

Burma's key position in southeast Asia impelled Japan to great efforts—during

the last war—to establish and maintain herself there firmly. The strategic significance of this area is today the cause of intensified Communist activity. There is no mistaking the fact that the Communist point of main effort has been changed from Korea to southeast Asia. Civil war has been planned in Burma and Siam. In Malaya, England at last has succeeded in putting down a long drawn-out insurrection, and in Indochina, the military forces of France have worn themselves down in a hopeless fight against the bestial virulence of Asiatic communism.

Conclusion

It is impossible not to recognize the threat to the non-Communist portion of the globe, of the situation that is taking shape in southeast Asia. Communism is engaged in subjugating this area without having to sacrifice a single Soviet soldier. If Indochina is given up by France, the loss of Malaya and Singapore would then be only a matter of time. From the position thus won, Communist China and the Soviet Union would threaten not only India, Indonesia, and Australia, but would be in a position to turn the flank of the chain of United States strategic bases stretching from the Philippines to Alaska by way of Japan.

In Europe, one is inclined to center his attention too largely on the political developments in this sector of the globe and on the events immediately behind the Iron Curtain, but the fact should not be overlooked that for the Soviet Union—in addition to the direct attack routes through Scandinavia and central Europe—there are also other potential routes of advance for reaching Paris, London, or Washington. These lead from the Middle East through Singapore or Teheran or over the Khyber Pass. They are circuitous only in appearance.

The Handling of Reserves in Land Warfare

Digested by the MILITARY REVIEW from an article by Major B. T. Wilson in "The Army Quarterly" (Great Britain) April 1954.

JOMINI, writing in 1837, suggested that the holding of reserves was then almost a new idea. "Reserves play an important role in modern warfare although formerly the idea of reserves was almost unknown. From the government which makes ready the national reserve on down to the platoon leader, everyone wants his reserves."

This rather trite paragraph might well have come straight out of that well-thumbed textbook, *Field Service Regulations*, Volume II.

Clausewitz, who is far more profound than Jomini, makes only a few dry comments about reserves. One of them runs as follows: "The use of a strategic reserve, even if one were available, will always be less effective the more the measure has a tendency to be one of a general nature." This shrewd observation still has weight today.

Napoleon, too, does not say much about reserves—he makes a trenchant remark about the almost invariable defeat of generals who think it good to keep fresh troops for the day following a battle. He also points out that in the mind of the multitude, when the enemy gets reinforcements, they, too, must get some before they feel equal to continuing the struggle.

But he made up for the omission to write much about reserves by his brilliant use of them on the battlefield. A recently published book, *Attack in the West*, by Major W. G. F. Jackson, on the 1796 campaign in Italy, well illustrates his skill in this matter. Time and again he scraped together the reserves which made the difference between victory and defeat. His later campaigns were doubtless grander, but this Italian one has a real message for commanders of the future, whose success may so often depend on the rapid reorganiza-

tion of tired troops and on the quick recovery of damaged material.

Later, when he had far larger armies under his command, Napoleon usually kept a reserve nearby which he used at the crescendo of his battle, generally with decisive effect. Particularly to be noted is that his reserves were the regiments of the *Garde*. Their impact on the battle was intended to be conclusive. Yet, even Napoleon sometimes could not face the terrible wrench of parting with his reserve. Jomini refers especially to his fatal caution at Borodino, when he refused early in the afternoon to throw his *Garde* into the battle. Hilaire Belloc in *The Campaign of 1812* gives a vivid picture of the situation at 1500, when the French had won the crest of the ridge and gazed eastward to the dead-level plain beyond, where the remains of the Russian Army still stood. If Napoleon had then gone forward with his *Garde*, "his presence and their arrival would have determined the day."

Wellington's Reserves

Wellington's handling of reserves was not so grand and formal as that of his great rival. To be sure, he kept a reserve if he could. But, as so often happens to British commanders, he constantly had barely enough troops to keep the enemy at bay. Even when he was able to hold a reserve, he frequently chose to fight a defensive-offensive battle in which the enemy made the opening move. He then placed his reserve where he could use it effectively when he went over to the attack.

Fighting in line rather than column, the British covered much ground and a proportion of their units was often set back checkerwise in local reserve, as at Waterloo. Generally, however, Wellington seemed

to deploy his army without holding a large reserve under his control. Yet his grip of a battle was so complete that he was always able to produce a brigade or a battalion at a critical moment. Well mounted and a fine horseman, he always appeared at a threatened point, so that his troops looked upon him as a reserve in himself. Hence, the remark of an officer in the Peninsula, "We would rather see his long nose in the fight than a reinforcement of 10,000 men."

The truth is that in the philosophy of war a commander and reserves are associated ideas—like those of battle and victory. In a great crisis, a commander is expected by all and sundry to produce reserves to meet it. When Ney pierced the British center at La Haye Sainte, Napoleon answered his urgent demand for more troops with considerable petulance. "Troops? Where do you expect me to get them from? Am I to make them?"

When a commander has exhausted his reserves, he has, indeed, nothing left but his own boldness and skill, which as Rommel aptly remarked "will be even more effective, if he has had the wit to create some sort of legend round himself." His opponent, Auchinleck, had perhaps rather neglected the business of legend building, but on at least two occasions in North Africa, he showed that he well knew how to be his own reserve.

Casting back after this digression about Wellington's nose and Napoleon's petulance, it is to be noted that during the 1806 campaign against Prussia, Napoleon left echelons of reserves on the Rhine and the Main under Mortier and Kellermann. They were, however, depots and training centers for convalescents, rather than active units whose absence would have reduced his fighting strength. Nevertheless, they were sufficient to secure his communications to the east. Mortier used his echelon to subdue the duchy of Hesse and afterward moved into Pomerania, while

Kellermann eventually occupied the country between the Rhine and the Elbe.

But of "strategic reserves," of fully trained divisions and corps, held far from where he proposed to operate, Napoleon had none. He was always intent on a decisive battle and wanted every unit upon which he could lay hands. Clausewitz approved of absolute war of this kind.

Franco-German War—1870

Prussia was rapidly and ingloriously defeated in 1806 at Jena and Auerstadt. Her long-service Army was out of date and badly officered. Its few reserves were improperly located.

The disgrace suffered at Jena prompted the creation of the German General Staff. For more than a century to follow, that same Staff contrived that Prussia, and later on modern Germany, should never again be short of reserves for the Army. Revolutionary France was the first to put national armies into the field, but Germany organized hers with such thoroughness that from early youth to late middle age every German male had his place in the military machine.

By 1870, the German Staff had discovered that 2 years' service with the colors, followed by transfer by age groups to successive reserve echelons, produced a very large Army in a very short time. It also grouped formations in their own particular territorial districts, so that divisions and corps could be trained and mobilized with the minimum movement of reservists and equipment. Transported by the new network of railways to their assembly positions, the German armies of 1870 were ready to move into France 19 days after the declaration of war.

All this seems very obvious now, but it had then escaped the attention of the French, who had a long-service Army and no practical ideas on how to mobilize and assemble it for war. The German Staff had, in fact, effected the first of the three

devastating surprises which it was to inflict on France within 70 years. In 1870, the German mobilization and assembly plans were so good that Moltke was able, literally, to put rings around the French Regular Army and to knock it out in 6 weeks.

World War I

The beginning and end of a great war particularly favor the attack. At the beginning, the troops who are forced to defend are inexperienced; and at the end, they are ripe for defeat—1914 was an example.

The Germans mobilized faster than the French and gave the first deadly blow by attacking through Belgium. But the indecision of the German High Command gave Joffre the time to form a sixth army to the north of Paris with reserve divisions. The new army outflanked those of the Germans and threatened them with the same kind of envelopment that they had planned for the French.

The victory of the Marne was the result. It was, essentially, a strategic victory and decided the final outcome of the war. After the Marne, grand and minor tactics, rather than strategy, influenced the subsequent course of events.

All wars use up men, but World War I used up men quicker than ever before. The defense was undeniably stronger than the attack. At the crisis of every action, the machine gun dominated the battlefield. On the Western front—which dwarfed all the others—the attack gained great successes, but neither side ever succeeded in completely routing the other. No relentless pursuit—such as that made by the Prussians after Waterloo—ever put the seal to victory. The war was, in essence, a war of attrition; reserves played a vital part.

Under such conditions, the relationship between the commander and his reserves became more important than ever. Right up to March 1918, attempts to establish

unity of command all failed because the British commander in France could not agree to lose control of his reserves. These were, in any event, scanty enough. Sir James Edmonds, the official historian, goes so far as to declare that general headquarters never had adequate reserves throughout the war. The reason for this was simple. The French, saddled with a bad plan of campaign, had lost so heavily at the outset that they became insistent on Great Britain taking a share of the war, which often bore little relation to what she was able to perform. Whenever new British formations arrived in France, every kind of pressure was placed on the British commander to compel him "to take over more line." The dispute never ceased. In 1917, it became a fierce political question in which Clemenceau and Lloyd George, by the ingenious device of the Supreme War Council at Versailles, showed signs of desiring to handle the reserves themselves.

Finally, Sir Douglas Haig had the double mortification of being compelled to take over 25 more miles of front from the French and of being denied reinforcements from England to bring his depleted divisions up to strength.

Ludendorff, in his last gamble with reserves in 1918, had thus the best possible conditions for a success, which very nearly proved decisive. *Vis-à-vis* reserves, the allied line at that time was seriously out of balance. General headquarters reserve consisted of eight divisions, located in pairs behind the four British armies, which disposed of 53 divisions between them. The French, on the other hand, had 39 divisions in reserve out of 99.

After Foch had taken over at Doullens, which was termed "the strategic control of military operations," the absurd committee at Versailles and the Prime Ministers ceased to concern themselves about the allocation of reserves. Although control was then in better hands, Foch proved to be a

hard taskmaster. In his view, the British could look after themselves, whereas the French Army was still recovering from the mutinies of 1917. For a long time, he persistently refused to relieve British divisions in the line with French ones. When a French division did finally take a post in the British line, it promptly lost Kemmel.

In retrospect, Foch's handling of reserves was masterly. He waited patiently throughout the grim summer of 1918 until the weight of available reserves had tipped toward the allies. On 7 August 1918, he had no general reserve as such, but he had 77 divisions not in the line, including some fine American divisions. The Germans only had 60. Haig was eager, finally, to disengage Amiens. Foch approved of his plan of attack and arranged for corps of the French First Army to take part. On 8 August 1918, the German Army suffered its greatest defeat of the war. Ludendorff was unbalanced by this unexpected blow. He sickened of his gamble in reserves and thought only of ending the war.

Apart from the key role which reserves were bound to play in this war of attrition, their handling in the forward zones presents many features of interest. The great difficulty was to get them into action at the right moment. Already at Neuve Chapelle on 10 March 1915, a set-piece attack on a 2-mile front had some initial success. But after the capture of that village, there was a fatal delay in the advance of the 8th Division, which was in reserve under corps orders. At Loos, the same mistake was repeated on a bigger scale, when the reserves, this time under general headquarters orders, reached the battlefield completely exhausted after four trying night marches. Communications from the front in those days were not good enough for the delicate timing which the launching of reserves requires.

By 1918, both British and French had had several years' experience of large-scale road and rail movements; yet during

the German offensives, the allied reserves constantly arrived very late and in poor condition for battle. Often, neither the commander of the reserves nor his units knew anything of the ground or of the state of the battle in which they were to engage. Their complicated supply systems, suddenly uprooted and moved, often worked badly or not at all. During defensive operations in particular, the reserves were apt to be literally pitchforked into the fight. It is not surprising that they often fought badly.

It has already been mentioned that the eight general headquarters reserve divisions, in March 1918, were located in pairs behind the four British armies in line. Sir James Edmonds suggests that this procedure followed the practice of the Russo-Japanese War. It did, at least, give the reserve divisions the opportunity of reconnoitering the country over which they might be called upon to operate.

The French General Headquarters reserves, however, seem to have been located in large groups, which were out of touch with events in the forward zones. They were, thus, far more of "a general nature" than the eight British reserve divisions and, as such, were probably less effective, just as Clausewitz suggests. Foch seems to have recognized this, for when he was firmly in the saddle in 1918, he discarded the idea of large groups of reserves, and was content to rely upon using divisions, which were out of the line, anywhere on the front.

However this may be, reserves do not seem to have been handled with the urgency which was necessary for their effective use. They were too divorced from the battlefield.

As has been shown, it seemed impracticable, on the Western front in World War I, to hurl all available reserves at a decisive point and to end the war in one great victory. Between the wars, the idea of doing so was forgotten by the soldiers

of most nations. But a handful of German soldiers did not forget it. General von Seeckt, with the nominal 100,000-man army and his mockup tanks, trained for the decisive attack, not for the defensive warfare which bewitched the French.

World War II

In 1939, Hitler did not hesitate to denude the West of divisions in order to be able to obliterate Poland quickly. Only 25 reserve divisions were left to hold the West Wall and two-thirds of these were not entirely fit for war. Not a single tank remained behind. There was only enough ammunition for a 3-day battle.

The French, if they had been so minded, could have attacked the West Wall with at least 75 divisions, complete superiority in armor, and fair strength in the air. But they did not. The German bluff of leaving a weak reserve army behind to hold the Western front was successful. Foch's precept, "Be daring, always be daring," was forgotten by France, but acted upon by her enemy.

In 1940, General von Manstein saw how a decisive victory—instead of what he called an inferior victory—could be gained in the West. It was, of course, the thrust through the Ardennes across the Meuse to the Channel. The German Army which carried out this simple, but brilliant, plan had no great superiority in numbers or equipment except, perhaps, in the air. A very small number of the German leaders believed that rapid and decisive warfare was still possible and acted accordingly. To give the devil his due—Hitler was one of them.

The French High Command reacted to the German breakthrough as though it were being made at the pace of infantry—like that of the Germans in 1914. Moreover, French doctrine on the large-scale counterattack dictated that it could not be launched effectively until the breakthrough was halted and its flanks located. This

conception, no doubt, derived from the miracle of the Marne. It bore no relation whatever to the appalling situation which in a few days confronted the French commander. The German breakthrough just rolled on to the Channel with scarcely a halt. Precise information about its flanks never reached the French General Headquarters. Many French reserve formations had moved into Belgium and Holland: the rest were used up in a vain attempt to form a defensive flank on the Somme facing north and east.

The Soviet Union

Victory in a war against the Soviet Union—even under the most favorable circumstances imaginable—is bound to rely much on reserves of men or equipment. Like Napoleon in 1812, Hitler hoped to win a decisive battle early in the campaign, but failed to do so. In the fall of 1941, time and space, mud and snow began to engulf the German armies. Reserves of men and matériel failed to reach the forward troops, who had to fight on for weeks and weeks without reinforcements and without relief. Even so, in 1942, Hitler might still have inflicted a decisive defeat on the main Soviet armies around Moscow. Typically, however, he turned away from so difficult a task, just as he had done from the Channel 2 years previously. By the end of 1942, the German armies were strung out across the steppes of the Soviet Union for hundreds of miles beyond their capacity in reserves. Even before the loss of the entire Sixth Army at Stalingrad, the disastrous 2-year retreat from the Soviet Union had already become inevitable.

The Soviet armies on the vast front from Murmansk to the Caucasus took time to change over to the attack. As the offensive developed, the Soviet General Staff gradually improved the technique of using reserves in the breakthrough battle. By 1944, they were being used on a new

system called *jarostnoje nastuplenie*, which is believed to mean "furious advance."

The Soviet General Staff pictured the impact of successive echelons of reserves on the battle as being like the successively exploding charges in a V-2 rocket. Offensives based on the new idea took a long time to mount, but were very effective when they were finally launched. In June 1944, for example, German Army Group Center consisting of 20 divisions had practically ceased to exist after a furious 6-day battle east and west of the Beresina. In 4 weeks the Soviets made a breakthrough which was 300 miles deep before the Germans, with their remarkable tenacity, could seal it off. No doubt, *jarostnoje nastuplenie* was tried by the Chinese in Korea, where it failed against a defense of far greater density and far more fire power than the Germans ever had in their great retreat. This has, no doubt, been a disappointment to the Soviet Union.

North Africa—1940-43

In the deserts of Cyrenaica, the British Eighth Army learned the technique of the quick recovery of damaged tanks and of reforming reserves of armor from the Germans. The outcome of a battle depended on the last reserve of tanks. In this respect, the action at Gazala, May 1942, is particularly instructive. Here, the British armor was used piecemeal. Its last thrust of significance was the counterattack against the wedge which Rommel had driven into the center of the Gazala position north of Bir Hacheim. The Germans had made good use of a hill in the fighting to recover tanks and to organize the anti-tank defense of the wedge. The British counterattack thus ran into prepared defenses and suffered heavy losses. The loss of Tobruk and the retreat to El Alamein followed.

By autumn 1942, the Eighth Army had Field Marshal Montgomery as its com-

mander and ample reserves of every kind. The skill of the first, and the advantage conferred by the second, together, produced a majestic change in British tactics. They became measured, orthodox, and irresistible. In due course, the allies cleared North Africa of all Axis troops and dominated the Mediterranean—the immemorial key to the control of southern Europe.

D-day—1944

How to handle the reserve formations of northwest Europe bedeviled Hitler, Rundstedt, and Rommel for months before the D-day landing. Rommel favored elaborate coast defenses which would make the landing so difficult that an immediate counter-attack, with armor, would easily be able to hurl back the attempted invasion into the sea.

Rundstedt wished to do what he could with forward troops on the beaches, but to delay his counterattack until the allies had shown their hand and were well committed. He would then try to make the counterattack so decisive that the invasion could not be renewed.

Judging by the initial success which attended Hitler's later thrust in the Ardennes, Rundstedt's conception was probably right. In the actual event, Hitler compromised between the two plans and lost the greater part of an army at Falaise.

If Rundstedt had been allowed to counterattack about the line of the Seine and had planned his air cover and communications accordingly, his reserves at Paris could have been regarded just as much part of the battle for Normandy as Napoleon's Middle and Old Guard were part of the battle of Waterloo. It would all have depended on whether the reserves could get to the battle. If they could not do so, they at once became reserves "of a general nature" and less effective.

One of the cardinal rules about reserves, which military administrators have often

overlooked, is that reinforcements must take precedence over new units. Reinforcements add nothing to the order of battle: they are but terrible reminders of the cost of war; whereas new units seem to add substance to an Army. They probably have the latest equipment, outstanding men, and dashing commanders. They can also be diverted to new tasks without the objections which might otherwise be raised. Yet, to a commander in the field whose units are wasting away before his eyes, new units can be anathema.

For, when formations and their units engage in action, they rapidly acquire the corporate experience and cohesion which are the marks of veteran troops. If casualties, and maybe heavy ones, are quickly replaced, those same formations and units will not lose the fighting value which they have acquired, but will continue to add to it. Withhold the transfusions of new blood, and the spirit of the formations will fall away most dismally. The once finely tempered weapons will become blunt and those who have to use them, discouraged.

The voluntary system was particularly prone to this misappropriation of reserves. In the South African war of 1899-1902, the sending out of new units instead of reinforcements was inveterate. During the dying spasms of the voluntary system in World War I, new units of Kitchener's Army claimed men who should properly have gone as reinforcements to Territorial Force units which were actually in the field.

In World War II, Hitler, who perpetrated almost every possible military "howler," did not fail to commit this one. When the bulk of the German Army was in the icy grip of a decisive winter campaign in the Soviet Union in 1941-42 and crying out for every kind of reinforcement, he did not send nearly enough and took the balance to form new units.

In World War II, the British Army was spared this old mistake. But it occasion-

ally dissipated reserves in other ways. Diversions were one. The matter is worth attention, since diversions can be looked upon as the besetting sin of a seapower. Clausewitz dilates upon them in his study of Napoleon's 1796 campaign in Italy. He condemns the fruitless expedition of 15,000 French soldiers to Ireland under General Hoche when Napoleon wanted every man he could get in Italy. He continues in the following terms: "The attraction, which diversions have for nearly all statesmen, is that they are not simple undertakings, but complicated ones. Entirely without reason, more advantages are promised from them, than from pursuance of the main object." He goes on to say that a diversion inevitably draws the attention of the enemy to a weakness which he might not bother about otherwise.

The expedition which was sent to Greece in the spring of 1941 had all the stigmas of an ill-timed diversion. The British commanders in North Africa were confident that, if the drive on Tripoli was vigorously pressed, they could destroy the entire Italian Army. The Greeks, themselves, were not at all enthusiastic about British help. They foresaw, with prophetic accuracy, that it would merely draw upon them a fuller measure of *furor Teutonicus*. The British force only fought in Greece for a few weeks. It suffered thousands of casualties and lost most of its equipment. The crowning misfortune, however, was that its absence, in Greece, made it impossible to finish off the Italians in North Africa, where the war dragged on for 2 more years, nearly losing us the Middle East in addition to making the loss of Hong Kong and Singapore inevitable.

The creation of special headquarters and formations without adequate reason was another expensive way of wasting manpower. The establishments of an army are worked out in great detail for the waging of war. New forms of warfare should be grafted on to the existing pattern. The

airborne formations and the experimental 79th Armored Division were successfully put together in this way.

The commando organization, on the other hand, was not so happily conceived. It developed from the special companies which were handpicked from divisions early in 1940. As an island power, Great Britain has undertaken combined operations for centuries. The needs of such operations should surely be met within the framework of the three services on a predominant partner basis. In retrospect, it is questionable whether the special commando organization did not result in many costly diversions and much waste of reserves.

In time of war, recipes for success in the field are sought by all the belligerents with all the eagerness which the alchemists of the Middle Ages displayed in their search for the philosophers' stone. Such recipes are, unhappily, just as difficult to find. This does not prevent all manner of people trying to do it. It is proper that they should. But they often create impressions which are plausible but unsound or impractical.

A typical instance was the exaggerated significance given to the use of dive bombers by the Germans during their conquest of France. The Army at that time certainly lacked air support of every description, but the Royal Air Force was then fully occupied with the problem of making the country secure against German bombers. So, the Army had to wait for a very long time for adequate air support and, even then, dive bombers did not figure in it. Current opinion in 1940 about air support for the Army was, indeed, by no means nonsensical. Plausible ideas seldom are. The more reason for examining them with great care, lest notions of great moment are missed. But an overhasty examination of a plausible impression may lead to heavy losses without adequate return. Closer study of the Chindit operations in

Burma, for instance, seems to show that although they were most nobly and gallantly carried out, they were not a reasonable hazard of war. The casualties and material losses were immense and incommensurate with the results obtained. Posterity will surely judge this famous enterprise as a waste of reserve force.

For waste of potential reserves, however, credit must be given once more to Hitler for the way in which he conducted the war after Germany was forced on to the defensive. His ideas on this did not run much further than holding untenable positions to the last round and to the last man. The same stubborn refusal to give up ground caused him to abandon dozens of divisions all over Europe in places where they could no longer be of the slightest assistance in the prosecution of the war. His reckless folly in this matter can be regarded as the *reductio ad absurdum* of the case against unnecessary detachments and waste of reserves.

Future Handling of Reserves

The foregoing brief and incomplete examination of the use of reserves in past warfare does not suggest any radical change in the future. The ideal procedure is still to use major reserves decisively in the Napoleonic manner and not to fritter away *la grande masse de manoeuvre* by using it piecemeal and ineffectively. The decisive moment in a modern battle may not come for a week or more, during which time a commander who wishes to win must hold or scrape together reserves in readiness for it.

The purpose of major reserves should never be vague. Their commander should look upon them at all times as part and parcel of the battle in progress, and be ready at the decisive moment to bring them into action at the right place.

The movement of reserves into battle today is more crucial than ever before. New expedients are required to facilitate

their approach, many of which are difficult to practice in peacetime. These will include the skillful use of a combination of byways, tracks, and cross-country movement during the hours of darkness. Airborne formations and air transport will play their part. Air cover will be an essential part of the action of reserves even when the general air situation is unfavorable. The last effort of the Luftwaffe in the Ardennes counterattack of 1944-45 shows what can be done in this respect.

Reserves now—as in the past—must be crack troops, since their task will be more difficult than that of the formations already engaged. To ensure that reserves are highly trained is one of the great problems of Western armies today.

Most important of all is the training of higher commanders in the supremely difficult task of handling reserves in a farflung decisive battle.

Exercises with troops involving two or three divisions are invaluable for teaching the tactics, the mechanics, and the administration of movement in advance or

withdrawal. They also teach something of the friction of war. But they have to be kept tidy and controlled, so that they usually provide little scope for general officers above the rank of division commander.

Numerous well conceived exercises without troops seem to provide the answer. General Guderian mentions them as having been extremely useful for the study of the German thrust to the Channel in 1940. Such exercises do not cost much money. They can also be conducted without the glaring publicity which detracts so much from the value of large maneuvers with troops.

The handling of reserves in a future war will be, without the shadow of a doubt, just as fateful as it was in France in 1914 and 1940. Modern war is so complicated that the action of reserves requires close study in advance and the rehearsal of details whenever possible. It will assist much in preventing them from being reserves of a general nature and, therefore, less effective.

Because of the increasing complexity of land warfare and the resultant greater battlefield demands upon the fighting men, the individual soldier, far from receding in importance, is emerging ever more clearly as the ultimate key to victory.

Upon his courage, upon his faith in himself and the cause he is fighting for, and upon his moral and spiritual strength will depend the final outcome of any armed struggle between nations. No machine can replace the intangible qualities of the human spirit nor the adaptability of the human mind.

Man is the master of weapons and not their servant. He is the indispensable element necessary to achieve victory, and will remain so in the foreseeable future.

General Matthew B. Ridgway

BOOKS OF INTEREST TO THE MILITARY READER

WELLINGTON AND HIS ARMY. By Godfrey Davies. 154 Pages. The Huntington Library, San Marino, Calif. \$3.00.

BY LT COL GEOFFREY D. SOLOMON
Australian Army

In the course of British history, the difficult transition from great soldier to great statesman has been made infrequently. Probably Cromwell and Wellington provide the outstanding examples, and it is a curious fact that each lacked, to a marked degree, that ease of manner and innate ability to attract other people readily which, while not an essential quality in the great leader, is certainly a desirable one.

It was Greville who wrote of Wellington (and he is quoted by Mr. Davies) that "This greatness was the result of a few striking qualities—a perfect simplicity of character without a particle of vanity and conceit, but with a thorough and strenuous self-reliance, a severe truthfulness, never misled by fancy or exaggeration, and an ever abiding sense of duty and obligation which made him the humblest of citizens and most obedient of subjects. The Crown never possessed a more faithful, devoted, and disinterested subject."

Mr. Davies has not attempted to build up Wellington as a popular leader. His principal aim has been to adjust the balance that he believes was tilted unfairly against Wellington by Sir Charles Oman in his various books, and to show that Wellington, the man, can match Wellington, the soldier, about whose greatness there is no question.

BRITISH POLITICS AND THE AMERICAN REVOLUTION. By Charles R. Ritcheson. 320 Pages. University of Oklahoma Press, Norman, Okla. \$4.00.

BY MAJ JAMES N. HIGHLEY, USAF

As in most conflicts, the American Revolution had its popular controversies which are outlined so completely in the Declaration of Independence. This book deals with the fundamental reason for the American Revolution. It points out that the colonists, at first, had no great desire for independence, but because the British Government was not ready for a commonwealth of nations, the colonists were finally forced to accept independence as the only means of satisfying their political desires.

The American colonists, because of their separation from the old formal political doctrines, had begun to develop some political thinking of their own, and the Anglo-American conflict was actually a conflict of rights growing out of diverging British and colonial political development. The Colonies developed their "federal" idea that they were bound to Great Britain, not through the supreme authority of Parliament, but through the person of the King.

As is clearly pointed out in this book, the internal politics of Great Britain during that period could not accept this concept of empire. By the time military pressure forced a willingness in Great Britain to accept it, it was too late to save this overseas empire which was committed to independence.

LAUGHTER IN HELL. By Stephen Marek. 256 Pages. The Caxton Printers, Ltd., Caldwell, Idaho. \$5.00.

By MAJ JACK D. STEVENS, *USAF*

This book is a captivating narrative of the true experiences of two prisoners of war of the Japanese, during World War II, and their comrades.

The horror and sufferings of prisoner of war life are not stressed in this account. Rather, the book dwells on the manner and method in which the prisoners managed to steal enough food for survival.

The author points out that the guards could be duped rather easily, and petty thievery for self-preservation developed into organized robbery, bribery, and sabotage. Some of the schemes and techniques employed, and the ends to which they were carried, are incredulous. It is a unique story written in a highly readable and entertaining style.

MANAGEMENT IN THE PUBLIC SERVICE. By John D. Millett. 417 Pages. McGraw-Hill Book Co., New York. \$5.50.

THE OBSERVER'S BOOK OF AIRCRAFT. By William Green and Gerald Pollinger. 287 Pages. Frederick Warne & Co., New York. \$1.25.

DECISION IN KOREA. By Rutherford M. Poats. 309 Pages. The McBride Co., New York. \$4.75.

By LT COL ROBERT C. CAMERON, *Inf*

An authentic history of the Korean conflict, *Decision in Korea* presents the Korean picture from the preparatory days, preceding the outbreak of hostilities, to the completion of the Armistice agreement.

The book is concise and sufficiently detailed for a clear understanding of the action in and behind the scenes of the battles for the Korean peninsula. This work is extremely interesting and an excellent source of information for the military reader.

AIRPLANE STRUCTURES. Volume I (4th Edition). By Alfred S. Niles and Joseph S. Newell. 607 Pages. John Wiley & Sons, Inc., New York. \$7.75.

THE ARMY LINEAGE BOOK. Volume II: Infantry. By the Office of the Chief of Military History. 859 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$2.00.

I FLEW FOR THE FÜHRER. By Heinz Knoke. 213 Pages. Henry Holt & Co., New York. \$3.00.

By LT COL MITCHEL GOLDENTHAL, *CE*

Heinz Knoke was 12 years old when the Nazis came to power, and 25 years old when the combined forces of the allies had eradicated Nazism. During these 13 years, Heinz was an active participant in the growth and eventual disintegration of Hitler's Germany, first as a member of the Hitler Youth, and then progressing through the ranks to become an ace German fighter pilot.

The book provides spectacular reading while recounting the high lights of the author's 2,000 operational flights and 52 aircraft "kills." Unfortunately, his political beliefs and ideologies sometimes permeate parts of the book. He may have been "a typical German boy being misled," but he certainly described shooting down and destroying *B-17s* with great gusto and pleasure.

However, it is an excellent illustration of how a member of Herman Göring's Luftwaffe fought and thought, and it also contains guarded glimpses of how he thinks today.

THE ORGANIZATION AND ROLE OF THE ARMY SERVICE FORCES. United States Army in World War II. By John D. Millett. 494 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. \$4.25.

FROM THE DANUBE TO THE YALU. By General Mark W. Clark. 363 Pages. Harper & Brothers, New York. \$5.00.

By LT COL MARSHALL H. ARMOR, JR., *Army*

"As soon, therefore, as the expenditure of force becomes so great that the political object is no longer equal in value, this object must be given up, and peace will be the result."

Thus, wrote Karl von Clausewitz, but it remained for General Clark to gain, in his words, "the unenviable distinction of being the first United States Army commander in history to sign an armistice without victory." He was not happy about it.

He preferred a decisive victory in Korea, and is convinced not only that the United Nations could have had one without provoking World War III, but should have.

"The Armistice was obtained and I signed it," he writes. "But I would be less than truthful if I failed to record that I put my signature on that document with a heavy heart. I was grateful that the killing was ended for a time, at least. But I had grave misgivings that some day my countrymen would be forced to pay a higher price in blood than it would have cost if the decision had been made to defeat the Communists in Korea."

General Clark believes American troops should get out of Korea—and stay out—meeting any new aggression with "the full might of American technical superiority." The forces there should be moved to Okinawa and to Japan until that nation has developed its own defenses. The Vietnamese Army should be built up, the formation of a Pacific Treaty Organization encouraged, and strong American air and naval forces should be maintained "ready to strike any aggressor from bases that form the front door to Asia."

NAPOLEON'S LETTERS. Translated and edited by J. M. Thompson. 309 Pages. E. P. Dutton & Co., New York. \$1.45.

THE CENTURY OF TOTAL WAR. By Raymond Aron. 379 Pages. Doubleday & Co., Garden City, New York. \$5.00.

By LT COL IRVING HEYMONT, GS

Mr. Raymond Aron takes a long and searching view of the world from World War I to the present. A noted philosopher of history and one of Europe's leading commentators on the contemporary scene, he presents several provocative theses.

Advancing the argument that because of technical expansion, use of propaganda, and the magnitude of the states, wars between major nations must be total wars, Mr. Aron traces the chain of events from Sarajevo to Panmunjom. He brings out that upheaval of existing orders and extinction of sovereignties followed each of the world wars. It is his contention that this destruction of social orders and national sovereignties laid the groundwork for succeeding wars. He feels that a national will to power was a larger factor than the Marxist contention of inherent conflicts within capitalism.

Out of the second world conflict arose a bipolarity—the world dominated by two giant powers. These powers face each other hostilely separated by a politically and economically weak Europe and an Asia in revolt. Mr. Aron concludes that the Soviet Union is a nation based on a philosophy hostile to all other existing political and social systems, and the seat of a secular religion dedicated to conquering the world. The moment of conflict, he believes, has arrived. The question is whether the present cold war is only a preparation or a substitute for total war.

Although this valuable book is an excellent analysis of the events since 1914, it suffers considerably either from a poor translation—no translator is listed—or from a very involved style of writing.

APPLIED ATOMIC ENERGY. By K. Fearnside, E. W. Jones, and E. N. Shaw. 156 Pages. Philosophical Library, New York. \$4.75.